California Regional Water Quality Control Board
Santa Ana Region

RESOLUTION NO. R8-2004-0001

Resolution Amending the Water Quality Control Plan for the Santa Ana River Basin to Incorporate an Updated Total Dissolved Solids (TDS) and Nitrogen Management Plan for the Santa Ana Region Including Revised Groundwater Subbasin Boundaries, Revised TDS and Nitrate-Nitrogen Quality Objectives for Groundwater, Revised TDS and Nitrogen Wasteload Allocations, and Revised Reach Designations, TDS and Nitrogen Objectives and Beneficial Uses for Specific Surface Waters

WHEREAS, the California Regional Water Quality Control Board, Santa Ana Region (hereinafter Regional Board), finds that:

1. An updated Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) was adopted by the Regional Board on March 11, 1994, approved by the State Water Resources Control Board (SWRCB) on July 21, 1994, and approved by the Office of Administrative Law (OAL) on January 24, 1995.

2. The updated Basin Plan incorporated the revised Total Inorganic Nitrogen (TIN) wasteload allocation that had been adopted and incorporated in the Basin Plan in 1991. The updated Basin Plan also included a revised Nitrogen and TDS management plan, including a revised TDS wasteload allocation for discharges to the Santa Ana River and its tributaries, revised findings regarding Nitrogen and TDS assimilative capacity in groundwater, and a plan for wastewater reclamation in the Region.

3. During consideration of adoption of the updated Basin Plan, watershed stakeholders questioned the validity of the groundwater quality objectives for TDS and nitrate-nitrogen and the Regional Board's Nitrogen/TDS management plan that implemented those objectives. A principal underlying concern was that the updated Basin Plan resulted in inappropriate constraints on wastewater recycling opportunities. Reuse of recycled water is a critical component of many agencies' plans to meeting rapidly increasing water demands in the Region. In response to these concerns, the Regional Board agreed to make the review of the objectives a high triennial review priority.

4. The Nitrogen/TDS Task Force (Task Force) was formed in 1995-96 to conduct studies regarding the TDS and nitrate-nitrogen objectives and other components of the N/TDS management plan. The Task Force was comprised of 22 water supply and wastewater agencies throughout the Region. The Task Force effort was coordinated by the Santa Ana Watershed Project Authority. Regional Board staff were active participants in the Task Force effort. Findings and recommendations based on the Task Force studies were presented to the Regional Board at numerous public workshops during the course of the studies.

5. The Task Force studies were guided by current law and regulation. The Task Force recommendations for changes to the TDS and nitrate-nitrogen water quality objectives for groundwater within the Region are based on consideration of the factors specified in Water Code Section 13241 and the state's antidegradation policy (SWRCB Resolution No. 68-16). The economic implications of all recommended changes to the N/TDS management plan were also considered. The Task Force studies were based on sound and objective science.

6. The Basin Plan amendments delineated in the attachment to this Resolution and described in detail in accompanying staff reports are the culmination of the multi-year, multi-million dollar (approximately $3.5 million) studies conducted by the Task Force to review groundwater TDS and nitrate-nitrogen objectives, groundwater subbasin boundaries, the TIN and TDS wasteload allocations and other components of the N/TDS management plan.

7. The Basin Plan amendments will assure the reasonable protection of the beneficial uses of surface and groundwaters within the Region and are consistent with the state's antidegradation policy (SWRCB Resolution No. 68-16).

8. The proposed amendment to the Basin Plan was developed in accordance with the California Water Code, Section 13240 et seq.

9. The Regional Board has considered the costs associated with implementation of this amendment and finds the costs to be reasonable.

10. The proposed amendment results in no potential for adverse effects, either individually or cumulatively, on fish and/or wildlife species.

11. The proposed amendment meets the "Necessity" standard of the Administrative Procedure Act, Government Code, Section 11352, subdivision (b).

12. The Regional Board submitted the relevant technical documents that serve as the basis for the proposed amendment to an external scientific review panel and has considered the comments and recommendations of that panel in drafting the amendment.

13. The proposed amendment will result in revisions to Basin Plan Chapter 3 "Beneficial Uses", Chapter 4 "Water Quality Objectives, and Chapter 5 "Implementation" .

14. The Regional Board discussed this matter at a workshop conducted on November 21, 2003 after notice was given to all interested persons in accordance with Section 13244 of the California Water Code. Based on the discussion at that workshop, the Board directed staff to prepare the appropriate Basin Plan amendment and related documentation to incorporate language authorizing an update of the total dissolved solids/nitrogen management plan for the Santa Ana Region.

15. The Regional Board prepared and distributed written reports (staff reports) regarding adoption of the Basin Plan amendment in accordance with applicable state and federal environmental regulations (California Code of Regulations, Section 3775, Title 23, and 40 CFR Parts 25 and 131).

16. The process of basin planning has been certified by the Secretary for Resources as exempt from the requirement of the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) to prepare an Environmental Impact Report or Negative Declaration. The Basin Plan amendment package includes staff reports, an Environmental Checklist, an assessment of the potential environmental impacts of the Basin Plan amendment, and a discussion of alternatives. The Basin Plan amendment, Environmental Checklist, staff reports, and supporting documentation are functionally equivalent to an Environmental Impact Report or Negative Declaration.

17. On January 22, 2004, the Regional Board held a Public Hearing to consider the Basin Plan amendment. Notice of the Public Hearing was given to all interested persons and published in accordance with Water Code Section 13244.

18. The Basin Plan amendment must be submitted for review and approval by the State Water Resources Control Board (SWRCB), and Office of Administrative Law (OAL) and U.S. Environmental Protection Agency (USEPA). Once approved by the SWRCB, the amendment is submitted to OAL and USEPA. The Basin Plan amendment will become effective upon approval by OAL and USEPA. A Notice of Decision will be filed.

NOW, THEREFORE, BE IT RESOLVED THAT:

1. Pursuant to Sections 13240 and 13241 of the California Water Code, the Regional Board, after considering the entire record, including oral testimony provided at the public hearing, adopts the amendment to the Water Quality Control Plan for the Santa Ana River Basin as set forth in the Attachment.

2. The Executive Officer is directed to forward copies of the Basin Plan amendment to the SWRCB in accordance with the requirements of Section 13245 of the California Water Code.

3. The Regional Board requests that the SWRCB approve the Basin Plan amendment in accordance with the requirements of Sections 13245 and 13246 of the California Water Code and forward it to the Office of Administrative Law and the USEPA for approval.

4. If during its approval process the SWRCB or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Regional Board of any such changes.

5. The Executive Officer is authorized to sign the Department of Fish and Game Certificate of Fee Exemption.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 22, 2004.

(original signed by)
Gerard J. Thibeault
Executive Officer

Attachment to Resolution No. R8-2004-0001

(Proposed Basin Plan amendment changes are shown as ~~strikeout~~ for deletions and underline for additions)

Chapter 3, "Beneficial Uses":

- **p. 3-3:** "More than one beneficial use may be identified for a given waterbody. The most sensitive use must be protected. ~~Water quality objectives are established (Chapter 4) which are sufficiently stringent to protect the most demanding use.~~ The Regional Board reserves the right to resolve any conflicts among beneficial uses based on the facts in a given case."

Add the following new sections prior to "Beneficial Use Tables" on page 3-5:

GROUNDWATER

Groundwater subbasin boundaries included in the 1975 and 1984 Basin Plans, and initially in this 1995 Basin Plan, were, for the most part, based on data and information collected in the 1950's and 1960's. Since these boundaries were first established in the 1975 Basin Plan, a considerable amount of new water level, water quality and geologic data has become available. As part of the 2004 update of the TDS/Nitrogen management plan in the Basin Plan (see further discussion of this work in Chapter 5 – Salt Management Plan), these new data were used to review and revise the sub-basin boundaries.

To accomplish this task, all available geologic studies of the Santa Ana Region, through 1995, were gathered and re-analyzed. A comprehensive database of water level and water quality data and well drilling logs was created and utilized to delineate revised groundwater subbasin boundaries, now designated as groundwater "Management Zones". The groundwater Management Zones are shown in Figures 3-3 through 3-7.

The specific technical basis for distinguishing each groundwater Management Zone is provided in the report entitled "TIN/TDS Study – Phase 2A Final Technical Memorandum," Wildermuth Environmental, Inc., July 2000. In general, the new groundwater Management Zone boundaries were defined on the basis of (1) separation by impervious rock formations or other groundwater barriers, such as geologic faults; (2) distinct flow systems defined by consistent hydraulic gradients that prevent widespread intermixing, even without a physical barrier; and (3) distinct differences in water quality. Groundwater flow, whether or not determined by a physical barrier, was the principal characteristic used to define the Management Zones. Water quality data were used to support understanding of the flow regime and to assure that unusually high or poor quality waters were distinguished for regulatory purposes.

In addition to these technical considerations, water and wastewater management practices and goals for the Chino Basin were considered and used to define an alternative set of Management Zone boundaries for that area. These so-called "maximum benefit" Management Zone delineations , shown in Figure 3-5a, were developed as part of recommendations by the Chino Basin Watermaster and the Inland Empire Utilities Agency (IEUA) to implement a "maximum benefit" proposal, including an Optimum Basin Management Plan (OBMP), for the area. These agencies have committed to the implementation of a specific set of projects and requirements in order to demonstrate that the "maximum benefit"

Management Zone boundaries , and particularly the "maximum benefit" nitrate-nitrogen and TDS objectives for these Zones (see Chapter 4), assure protection of beneficial uses and are of maximum benefit to the people of the state (see Chapter 5, VII. Maximum Benefit Implementation Plans for Salt Management, A. Salt Management – Chino Basin and Cucamonga Basin). These "maximum benefit" Management Zone boundaries apply for regulatory purposes provided that the Regional Board continues to find that the Watermaster and IEUA are demonstrating "maximum benefit" by timely and appropriate implementation of these agencies' commitments. If the Regional Board finds that these commitments are not being met and that "maximum benefit" is not being demonstrated, then the Management Zone boundaries for the Chino Basin shown in Figure 3-5b apply for regulatory purposes.

PRADO BASIN MANAGEMENT ZONE (PBMZ)

The flood plain behind Prado Dam has unique hydraulic characteristics. Chino Creek, Cucamonga Creek (which flows into Mill Creek) and Temescal Creek join the Santa Ana River behind the dam. Flood control operations at the dam, coupled with an extremely shallow groundwater table and an unusually thin aquifer, significantly affect these surface flows, as well as subsurface flows in the area. Depending on how the dam is operated, surface waters may or may not percolate behind the dam. There is little or no groundwater storage in the flood plain behind the dam. Any groundwater in storage is forced to the surface because the foot of Prado Dam extends to bedrock and subsurface flows cannot pass through the barrier created by the dam and the surrounding hills. Given these characteristics, this area is designated as a surface water management zone, rather than a groundwater management zone. The Prado Basin Management Zone is generally defined by the 566-foot elevation above mean sea level. It extends from Prado Dam up Chino Creek, Reach 1A and 1B to the concrete-lined portion near the road crossing at Old Central Avenue, up the channel of Mill Creek (Prado Area) to where Mill Creek becomes named as Cucamonga Creek and the concrete-lined portion near the crossing at Hellman Road, up what was formerly identified as Temescal Creek, Reach 1A (from the confluence with the Santa Ana River upstream of Lincoln Avenue) (this area is indistinguishable because of shifting topography and is now considered a part of the Prado Basin Management Zone), and up the Santa Ana River, Reach 3 to the 566-foot elevation (just west of Hamner Avenue). The Prado Basin Management Zone encompasses the Prado Flood Control Basin, which is a created wetlands as defined in this Plan (see the discussion of wetlands elsewhere in this Chapter). Orange County Water District's wetlands ponds are also located within the Prado Basin Management Zone.

The beneficial uses of the proposed PBMZ include all of the beneficial uses currently designated for the surface waters identified above. The PBMZ also incorporates the Prado Flood Control Basin. The beneficial uses previously identified for this Basin are designated also for the Zone (See Table 3-1, Beneficial Uses, page 3-25).

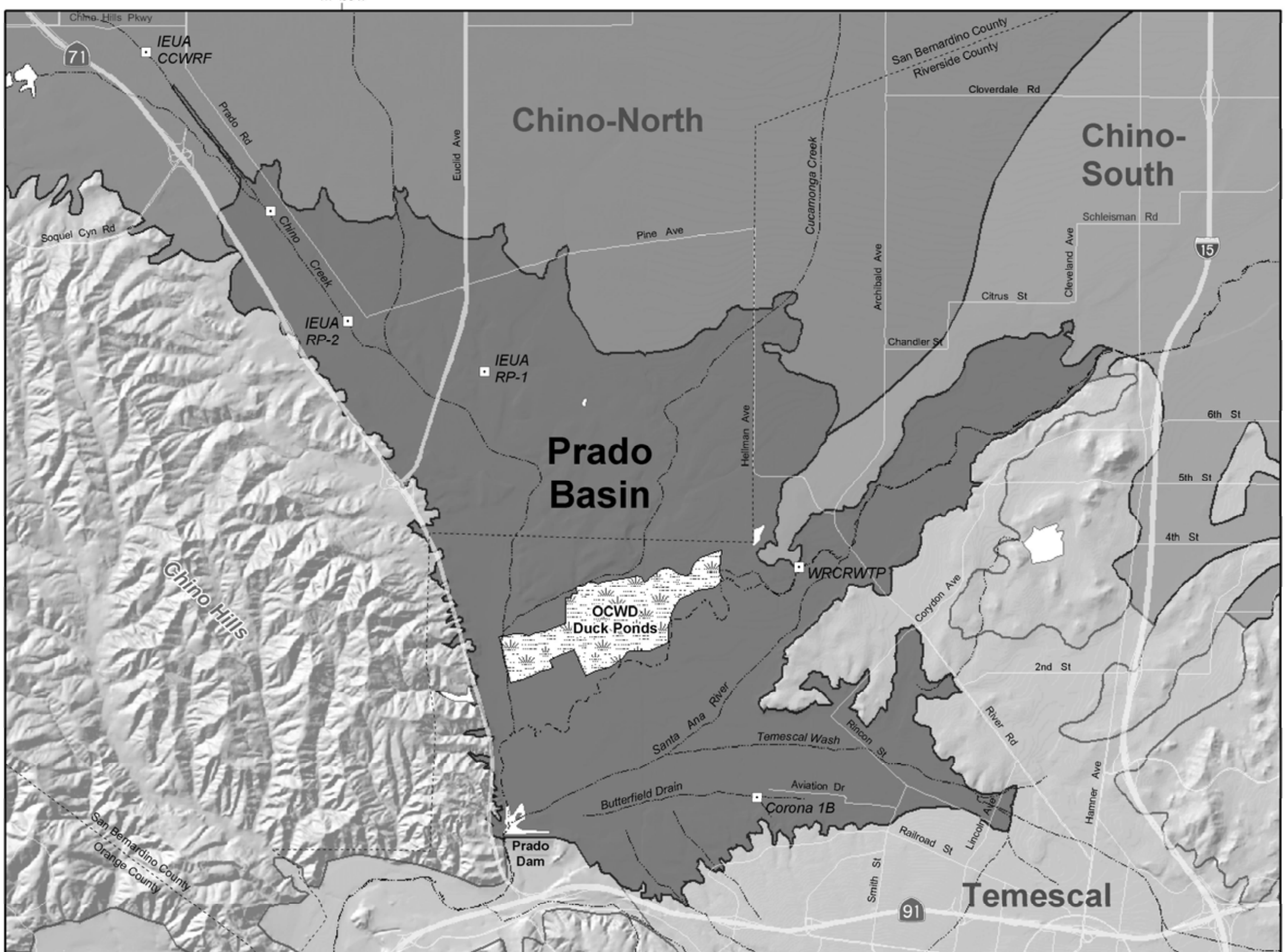
The Prado Basin Management Zone is shown in Figure 3-2.

Insert the following Figures:

- Figure 3-2 Prado Basin Management Zone Boundaries
- Figure 3-3 Management Zone Boundaries San Bernardino Valley and Yucaipa/Beaumont Plains
- Figure 3-4 Management Zone Boundaries – San Jacinto Basins
- Figure 3-5a Management Zone Boundaries – Chino (Maximum Benefit), Colton and Riverside Basins
- Figure 3-5b Management Zone Boundaries – Chino (Antidegradation), Colton and Riverside Basins
- Figure 3-6 Management Zone Boundaries – Elsinore – Temescal Valleys
- Figure 3-7 Management Zone Boundaries – Orange County Basins

- **Revise p. 3-17, 3-18, 3-19 and 3-25 (Table 3-1 BENEFICIAL USES – INLAND SURFACE STREAMS AND WETLANDS) as shown in the following pages.**

- **Delete pages 3-26 through 3-28, Table 3-1 BENEFICIAL USES - GROUNDWATER SUBBASINS and replace with the following new pages 3-26 through 3-28. NOTE: Big Bear Valley, Garner Valley and Idyllwild Area are identified in the current Basin Plan as groundwater subbasins. They are identified as groundwater management zones in the new pages, shown below. No changes to the boundaries of these groundwater bodies are proposed.**



Map Explanation

Management Zone Boundary

Rivers & Streams

Recycled Water Discharge Location

Produced by:

WE Wildermuth Environmental, Inc.
415 North El Camino Real Suite A
San Clemente, CA 92672
949.498.9294
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-2.mxd

0 1 Miles
0 2 KM

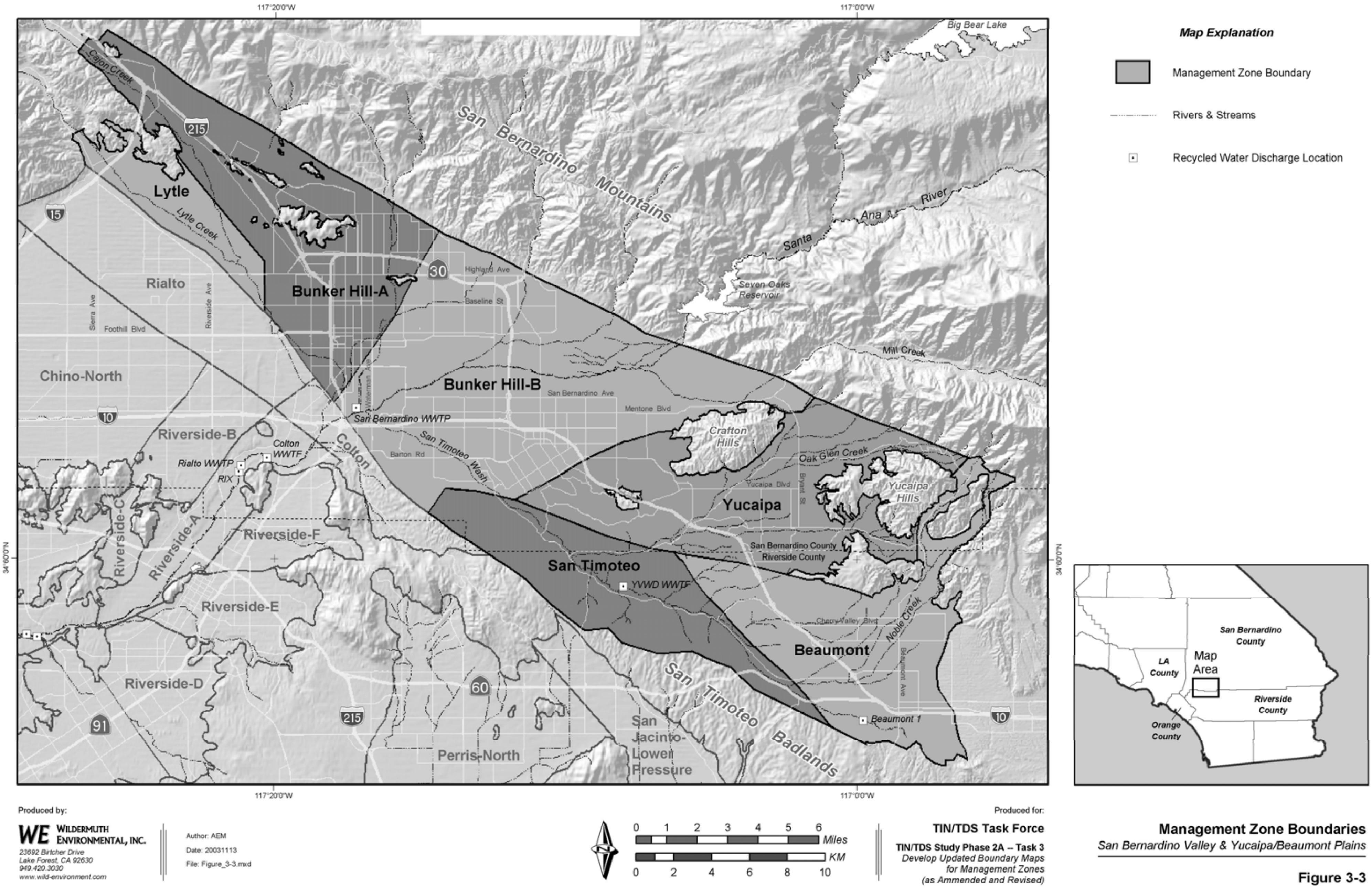
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Prado Basin Management Zone Boundaries

Figure 3-2



Produced by:

WE Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-3.mxd

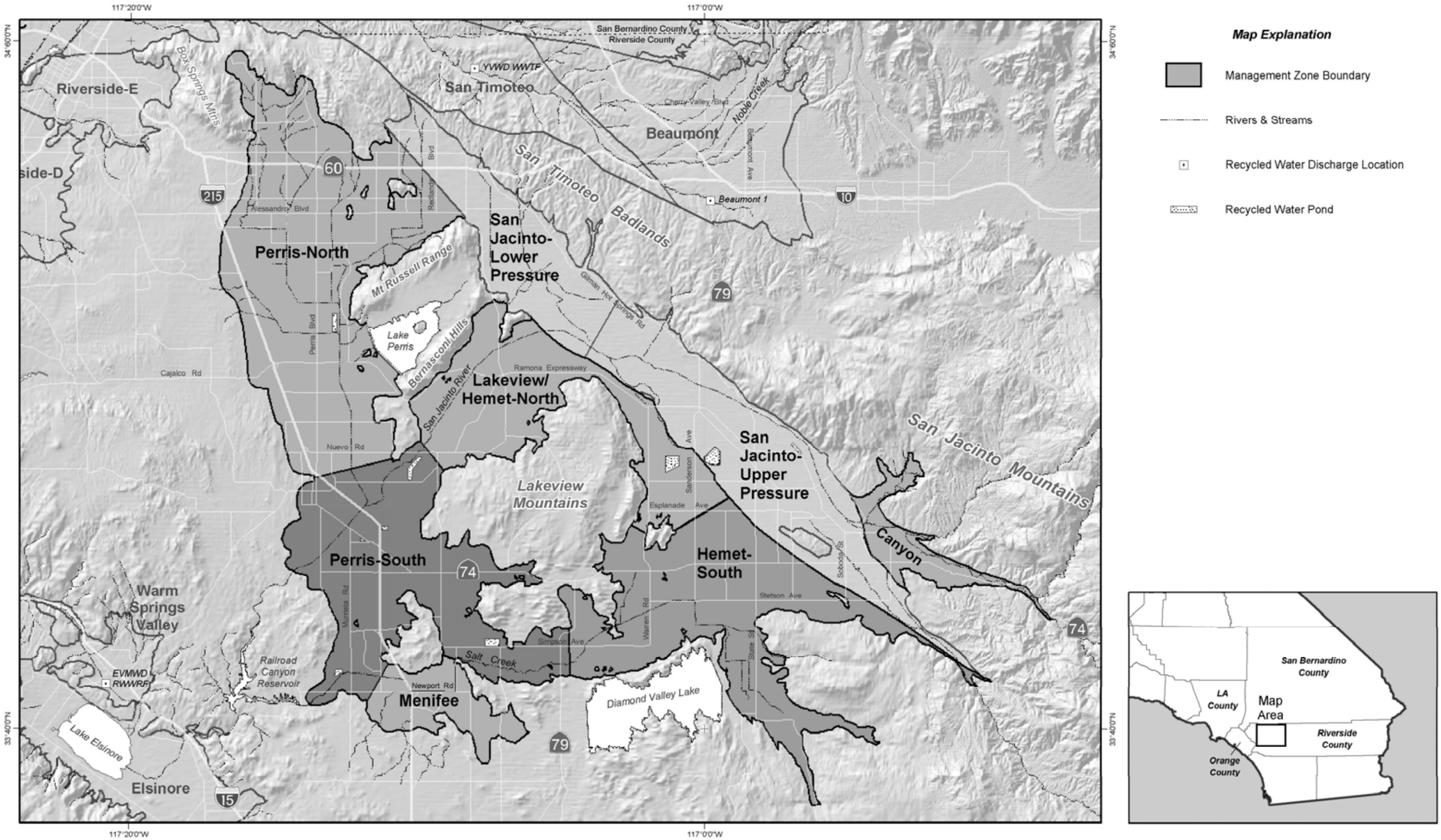
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
San Bernardino Valley & Yucaipa/Beaumont Plains

Figure 3-3



Produced by:

WE Wildermuth Environmental, Inc.
23692 Birtcher Drive
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949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-4.mxd

0 1 2 3 4 5 6 Miles
0 2 4 6 8 10 KM

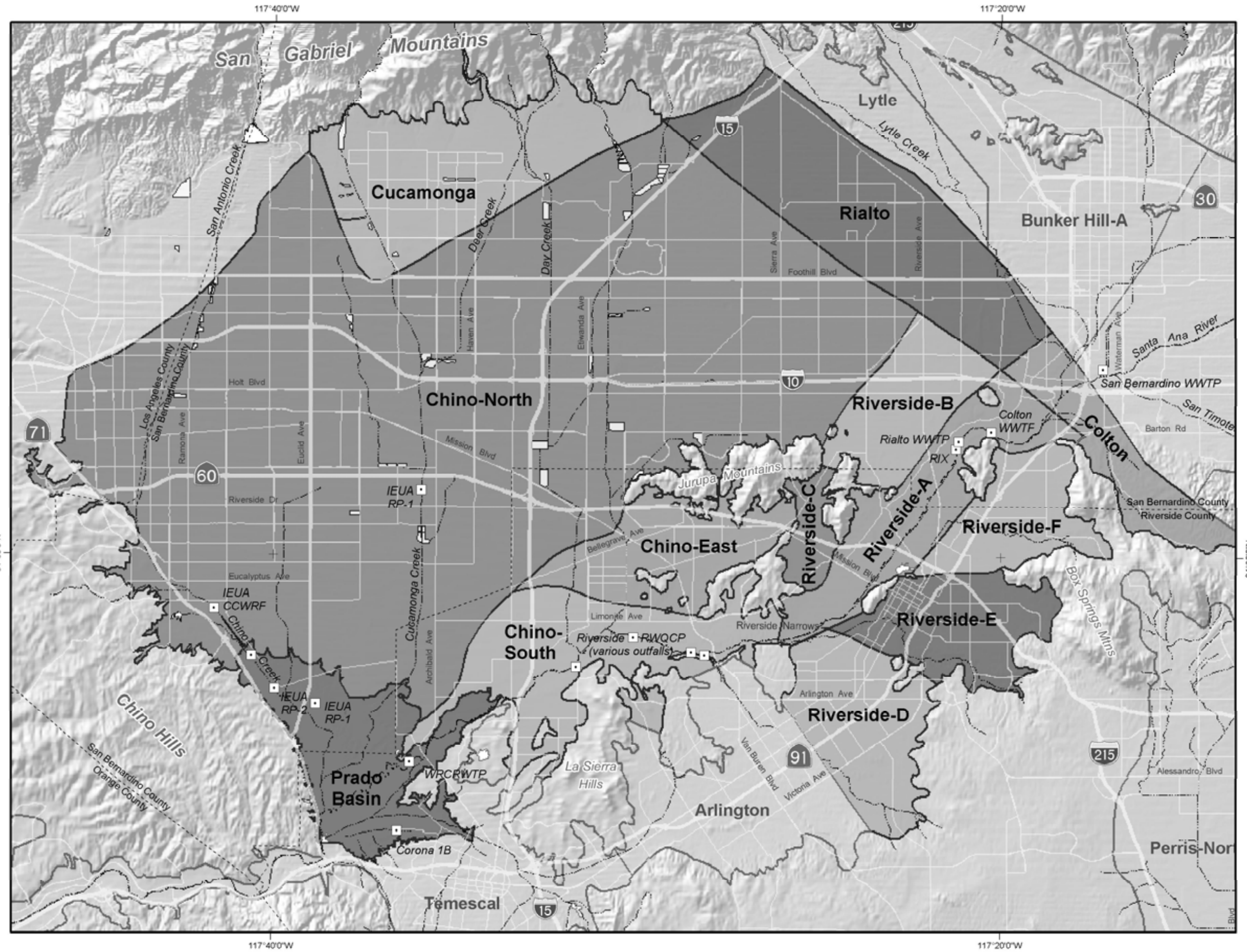
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
San Jacinto Basins

Figure 3-4



Map Explanation

Management Zone Boundary

Rivers & Streams

Recycled Water Discharge Location

Produced by:

WE WILDERMUTH ENVIRONMENTAL, INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-5a.mxd

0 1 2 3 4 5 6 Miles
0 2 4 6 8 10 KM

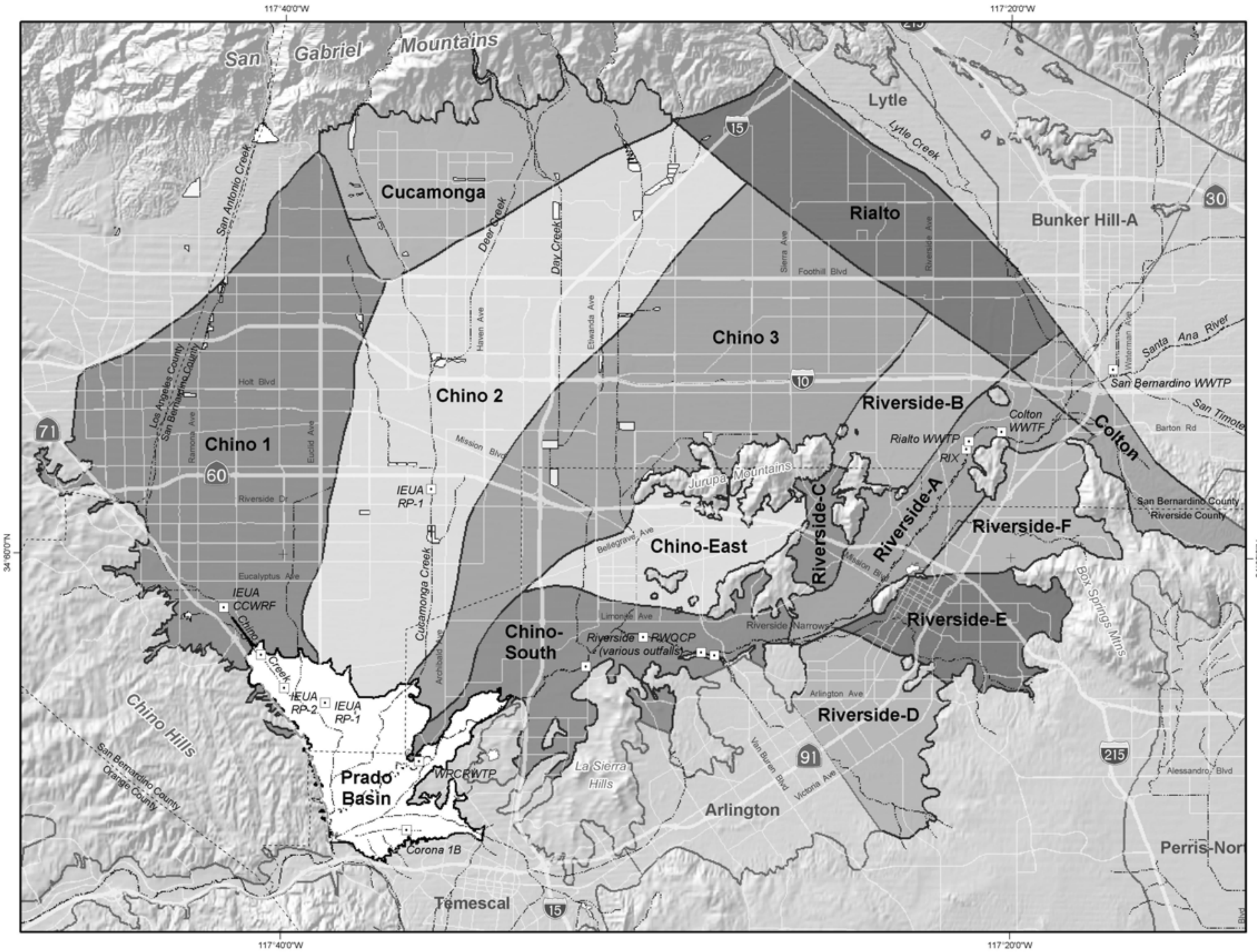
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
Chino (Maximum Benefit), Rialto-Colton, & Riverside Basins

Figure 3-5a



Map Explanation

Management Zone Boundary

Rivers & Streams

Recycled Water Discharge Location

Produced by:

WE WILDERMUTH ENVIRONMENTAL, INC.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-5b.mxd

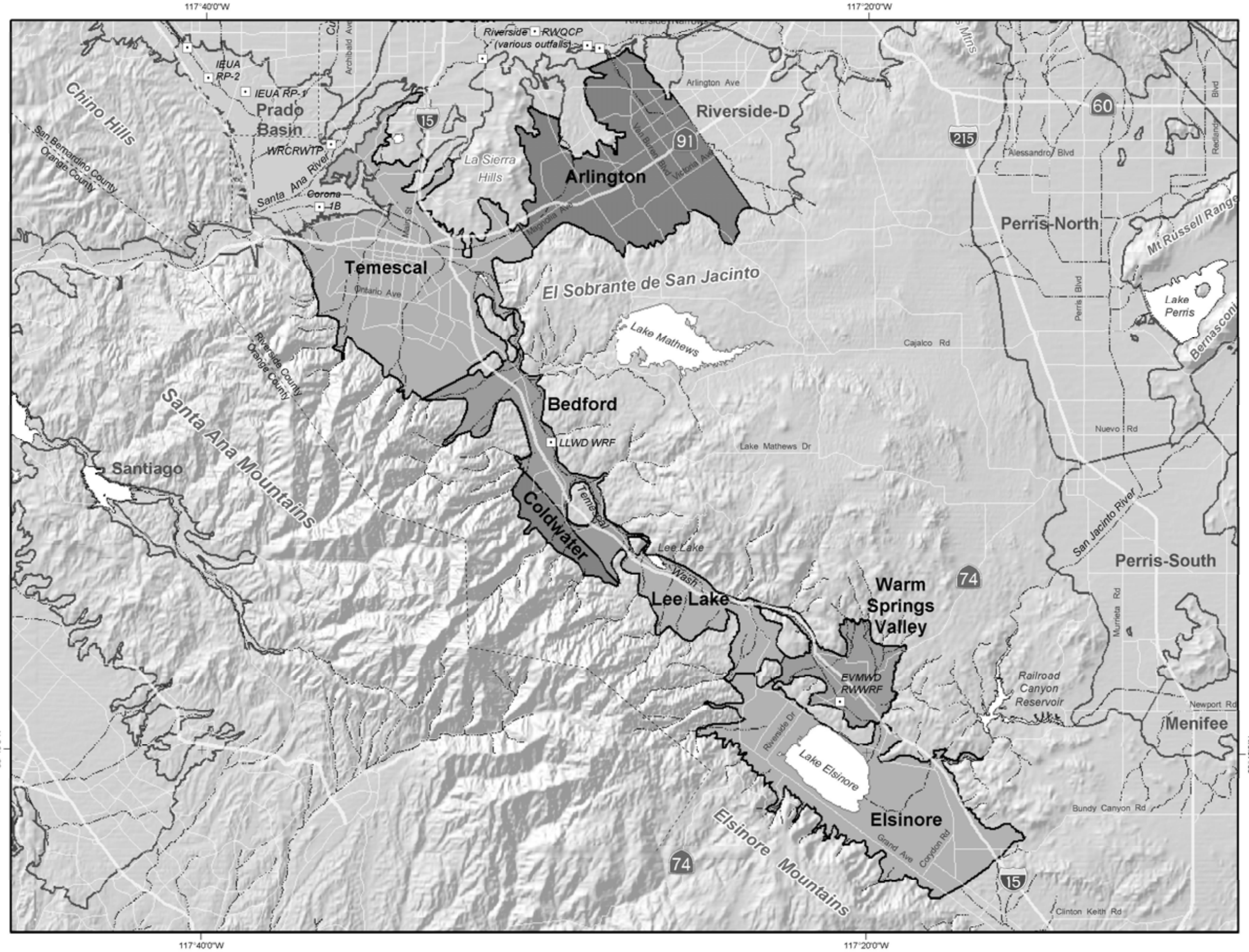
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
Chino (Anti-degradation), Rialto-Colton, & Riverside Basins

Figure 3-5b



Map Explanation

Management Zone Boundary

Rivers & Streams

Recycled Water Discharge Location

Produced by:

WE Wildermuth Environmental, Inc.
23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-6.mxd

0 1 2 3 4 5 6 Miles
0 2 4 6 8 10 KM

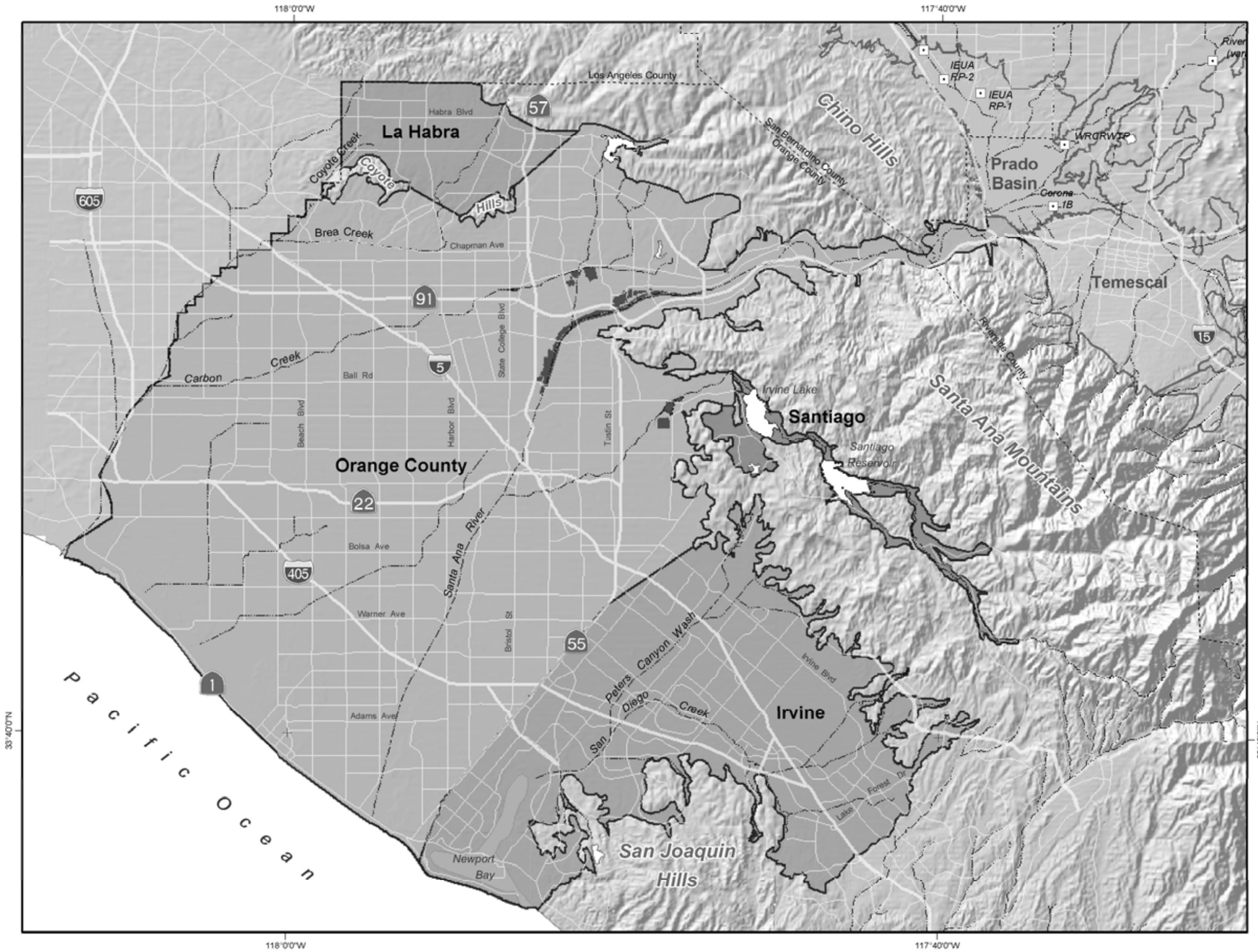
Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
Elsinore/Temescal Valleys

Figure 3-6



Map Explanation

- Management Zone Boundary
- Rivers & Streams
- Recycled Water Discharge Location
- Orange County Water District Forebay Recharge Facilities

Produced by:

WE WILDERMUTH ENVIRONMENTAL, INC.

23692 Birtcher Drive
Lake Forest, CA 92630
949.420.3030
www.wild-environment.com

Author: AEM
Date: 20031113
File: Figure_3-7.mxd

0 1 2 3 4 5 6 Miles

0 2 4 6 8 10 KM

Produced for:

TIN/TDS Task Force

TIN/TDS Study Phase 2A -- Task 3
Develop Updated Boundary Maps for Management Zones (as Ammended and Revised)

Management Zone Boundaries
Orange County Basins

Figure 3-7

Table 3-1 Beneficial Uses

Excerpt, Page 3-17, 3-18

INLAND SURFACE STREAMS	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
San Timoteo Area Streams																						
San Timoteo Creek																						
~~Reach 1 - Santa Ana River Confluence to Gage at San Timoteo Canyon Road~~	~~+~~	~~I~~			~~I~~			~~I[3]~~	~~I~~		~~I~~				~~I~~						~~801.52~~	~~801.53~~
Reach 1A – Santa Ana River Confluence to Barton Road	+	I						I[3]	I		I				I						801.52	
Reach 1B – Barton Road to Gage at San Timoteo Canyon Rd	+	I			I			I[3]	I		I				I						801.52	
Reach 2 - Gage at San Timoteo Canyon Road to Confluence with Yucaipa Creek	+				X			X	X		X				X						801.61	
Reach 3 - Confluence with Yucaipa Creek to ~~Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24)~~ confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)	+				X			X	X		X				X						801.61	
~~Reach 4 - Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24) t~~o ~~Confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)~~	~~+~~				~~X~~			~~X~~	~~X~~		~~X~~				~~X~~						~~801.62~~	

[3] Access prohibited in some portions by San Bernardino County Flood Control District

X Present or Potential Beneficial Use　　I Intermittent Beneficial Use　　+ Excepted from MUN (see text)

Table 3-1 Beneficial Uses

Excerpt, Page 3-19

INLAND SURFACE STREAMS	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
Prado Area Streams																						
Chino Creek																						
~~Reach 1 - Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.~~	~~+~~							~~X~~	~~X~~		~~X~~				~~X~~	~~X~~					~~801.21~~	
Reach 1A - Santa Ana River confluence to downstream of confluence with Mill Creek (Prado Area)	+							X	X		X				X	X					801.21	
Reach 1B - Confluence with Mill Creek (Prado Area) to beginning of concrete-lined channel south of Los Serranos Rd.**	+							X	X		X				X	X					801.21	
Reach 2 - Beginning of concrete-lined channel south of Los Serranos Rd. to confluence with San Antonio Creek	+							X[1]	X			X			X						801.21	
Temescal Creek																						
~~Reach 1A – Santa Ana River Confluence to Lincoln Ave.~~	~~+~~	~~X~~	~~X~~		~~X~~			~~X[4]~~	~~X~~		~~X~~				~~X~~	~~X~~	~~X~~				~~801.25~~	
Reach 1~~B~~ – Lincoln Ave. to Riverside Canal	+							X[4]	X		X				X						801.25	

[3] Access prohibited in some portions by San Bernardino County Flood Control District
[4] Access prohibited in some portions by Riverside County Flood Control
** The confluence of Mill Creek is in Chino Creek, Reach 1B

X Present or Potential Beneficial Use I Intermittent Beneficial Use + Excepted from MUN (see text)

Table 3-1 Beneficial Uses

Excerpt, Page 3-25

WETLANDS (INLAND)	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
San Joaquin Freshwater Marsh**	+							X	X		X			X	X	X					801.11	801.14
Shay Meadows	I							I	I				I		I						801.73	
Stanfield Marsh**	X							X	X				X		X	X					801.71	
~~Prado Flood Control Basin**~~ Prado Basin Management Zone [@]	+							X	X		X				X	X					~~801.25~~802.21	
San Jacinto Wildlife Preserve**	+							X	X		X			X	X	X					802.21	802.14
Glen Helen	X							X	X		X				X						801.59	

** This is a created wetlands as defined in the wetlands discussion
[@] The Prado Basin Management Zone includes the Prado Flood Control Basin, a created wetland as defined in the Basin Plan (see Chapter 3, pages 3-3 through 3-5)

X Present or Potential Beneficial Use I Intermittent Beneficial Use + Excepted from MUN (see text)

Table 3-1 Beneficial Uses, Page 3-26

~~GROUNDWATERS SUBBASIN~~ **Groundwater Management Zones**	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
UPPER SANTA ANA RIVER BASIN																						
Big Bear Valley	X			X																	801.71	801.73
Beaumont	X	X	X	X																	801.62	801.63, 801.69
Bunker Hill – A	X	X	X	X																	801.52	801..52
Bunker Hill – B	X	X	X	X																	801.52	801.53, 801.54, 801.57, 801.58
Colton	X	X	X	X																	801.44	801.45
Chino North "maximum benefit" ++	X	X	X	X																	801.21	481.21, 481.23,
Chino 1 – "antidegradation" ++	X	X	X	X																	801.21	481.21
Chino 2 – "antidegradation" ++	X	X	X	X																	801.21	
Chino 3 – "antidegradation" ++	X	X	X	X																	801.21	
Chino East @	X	X	X	X																	801.21	801.27
Chino South @	X	X	X	X																	801.21	801.25, 801.26
Cucamonga	X	X	X	X																	801.24	801.21
Lytle	X	X	X	X																	801.59	801.42
Rialto	X	X	X	X																	801.44	801.21, 801.43
San Timoteo	X	X	X	X																	801.62	801.61
Yucaipa	X	X	X	X																	801.61	801.55, 801.63, 801.67

++ Chino North "maximum benefit" management zone applies unless Regional Board determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, the Chino 1, 2 and 3 "antidegradation" management zones would apply (see also discussion in Chapter 5).

@ Chino East and South are the designations in the Chino Basin Watermaster "maximum benefit" proposal (see Chapter 5) for the management zones identified by Wildermuth Environmental, Inc. (July 2000) as Chino 4 and 5, respectively.

X Present or Potential Beneficial Use   I Intermittent Beneficial Use   + Excepted from MUN (see text)

Table 3-1 Beneficial Uses, Page 3-27

Groundwater Management Zones	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
MIDDLE SANTA ANA RIVER BASIN																						
Arlington	X	X	X	X																	801.26	
Bedford	X	X	X	X																	801.32	801.31
Coldwater	X	X	X	X																	801.31	
Elsinore	X	X		X																	802.31	
Lee Lake	X	X	X	X																	801.34	
Riverside – A	X	X	X	X																	801.27	801.44
Riverside – B	X	X	X	X																	801.27	801.44
Riverside – C	X	X	X	X																	801.27	
Riverside – D	X	X	X	X																	801.27	801.26
Riverside – E	X	X	X	X																	801.27	
Riverside – F	X	X	X	X																	801.27	
Temescal	X	X	X	X																	801.25	

X Present or Potential Beneficial Use I Intermittent Beneficial Use + Excepted from MUN (see text)

Table 3-1 Beneficial Uses, Page 3-28

Groundwater Management Zones	BENEFICIAL USE																				HYDROLOGIC UNIT	
	MUN	AGR	IND	PROC	GWR	NAV	POW	REC1	REC2	COMM	WARM	LWRM	COLD	BIOL	WILD	RARE	SPWN	MAR	SHEL	EST	Primary	Secondary
SAN JACINTO RIVER BASIN																						
Garner Valley	X	X																			802.22	
Idyllwild Area	X		X																		802.22	802.21
Canyon	X	X	X	X																	802.21	
Hemet - South	X	X	X	X																	802.15	802.13, 802.21
Lakeview – Hemet North	X	X	X	X																	802.14	802.15
Menifee	X	X		X																	802.13	
Perris North	X	X	X	X																	802.11	
Perris South	X	X																			802.11	802.12, 802.13
San Jacinto – Lower	X	X	X																		802.21	802.11
San Jacinto – Upper	X	X	X	X																	802.21	802.23
LOWER SANTA ANA RIVER BASIN																						
La Habra	X	X																			845.62	
Santiago	X	X	X																		801.12	801.11
Orange	X	X	X	X																	801.11	801.13, 801.14, 845.61, 845.63
Irvine	X	X	X	X																	801.11	

X Present or Potential Beneficial Use　　I Intermittent Beneficial Use　　+ Excepted from MUN (see text)

Chapter 4, Water Quality Objectives

- **p. 4-1:** **“**The narrative water quality objectives below are arranged alphabetically. They vary in applicability and scope, reflecting the variety of beneficial uses of water ~~which~~ that have been identified (Chapter 3). Where numerical ~~limits~~ objectives are ~~specified~~ specified, they generally represent the ~~maximum~~ levels that will protect ~~allow the~~ beneficial uses. ~~to continue unimpaired~~. However, in establishing waste discharge requirements for specific discharges, the Regional Board may find that more stringent levels are necessary to protect beneficial uses.”

- **p. 4-11**, GROUNDWATERS: “The narrative objectives ~~which~~that are included below apply to all groundwaters, as noted. In addition, specific numerical objectives are listed in Table 4-1. With the exception of the “maximum benefit” objectives identified in this Table (see further discussion below and in Chapter 5), w~~W~~here more than one objective is applicable, the stricter shall apply.”

- **Revise the following groundwater narrative water quality objectives**

Chloride
Excess chloride concentrations lead primarily to economic damage rather than public health hazards. Chlorides are considered to be among the most troublesome anion in water used for industrial or irrigation purposes since they significantly affect the corrosion rate of steel and aluminum and can be toxic to plants. A safe value for irrigation is considered to be less than 175mg/L of chloride. Excess chlorides affect the taste of potable water, so drinking water standards are generally based on potability rather than on health. The secondary drinking water standard for chloride is 500mg/L.

~~The chloride objectives listed in Table 4-1~~ Chloride concentrations shall not ~~be~~ exceed~~ed~~ 500 mg/L in groundwaters of the region designated MUN as a result of controllable water quality factors.

Dissolved Solids, Total (Total Filtrable Residue)
The Department of Health Services recommends that the concentration of total dissolved solids (TDS) in drinking water be limited to ~~1000~~ 500 mg/L (secondary drinking water standard), due to taste considerations. For most irrigation uses, water should have a TDS concentration under 700 mg/L. Quality related consumer cost analyses have indicated that a benefit to consumers exists if water is supplied at or below 500mg/L TDS.

The dissolved mineral content of the waters of the region, as measured by the total dissolved solids test (“Standard Methods for the Examination of Water and Wastewater, 20~~16~~th Ed.,” ~~1985~~1998: ~~209B~~2540C (180˚C), p.~~95~~2-56), shall not exceed the specific objectives listed in Table 4-1 as a result of controllable water quality factors. (See also discussion of management zone TDS and nitrate nitrogen water quality objectives below).

Hardness (as $CaCO_3$)
The major detrimental effect of hardness is economic. Any concentration (reported as mg/L $CaCO_3$) greater than 100mg/L results in the increased use of soap, scale buildup in utensils in domestic uses, and in plumbing. Hardness in industrial cooling waters is generally objectionable above 50mg/L.

~~The objectives listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors. If no hardness objective is listed in Table 4-1, the~~ The hardness of receiving waters used for municipal supply (MUN) shall not be increased as a result of waste discharges to levels that adversely affect beneficial uses.

Nitrate
High nitrate concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate (as NO_3) is 45 mg/L or 10 mg/L (as N).

Nitrate-nitrogen concentrations listed in Table 4-1 shall not be exceeded as a result of controllable water quality factors. ***(See also discussion of management zone TDS and nitrate nitrogen water quality objectives below).***

Sodium
The presence of sodium in drinking water may be harmful to persons suffering from cardiac, renal and circulatory diseases. It can contribute to taste effects, with the taste threshold depending on the specific sodium salt. Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of soil quality because of the presence of sodium in irrigation water is cumulative and is accelerated by poor drainage.

The California Department of Health Services and the U.S. Environmental Protection Agency have not provided a limit on the concentration of sodium in drinking water. ~~The sodium objectives listed in Table 4-1~~ Sodium concentrations shall not ~~be~~ exceed~~ed~~ 180 mg/L in groundwaters designated MUN as a result of controllable water quality factors.

Groundwaters designated AGR shall not exceed a sodium absorption ratio (SAR[1]) of 9 as a result of controllable water quality factors.

Sulfate
Excessive sulfate, particularly magnesium sulfate ($MgSO_4$), in potable waters can lead to laxative effects, but this effect is temporary. There is some taste effect from magnesium sulfate in the range of 400-600mg/L as $MgSO_4$. The secondary drinking water standard for sulfate is 500mg/L. Sulfate concentrations in waters native to this region are normally low, less than 40mg/L, but imported Colorado River water contains approximately 300mg/L of sulfate.

~~The objectives listed in Table 4-1~~ Sulfate concentrations shall not ~~be~~ exceed~~ed~~ 500 mg/L in groundwaters of the region designated MUN as a result of controllable water quality factors.

- **Add the following at the end of the GROUNDWATERS objectives:**

Management Zone TDS and Nitrate-nitrogen Water Quality Objectives

The TDS and nitrate-nitrogen objectives specified in the 1975 and 1984 Basin Plans, and initially in this 1995 Basin Plan, were based on an evaluation of groundwater samples from the five year period 1968 through 1972. This period represented ambient quality at the time of preparation of the 1975 Basin Plan. As part of the 2004 update of the TDS/Nitrogen management plan in the Basin Plan, historical ambient quality was reviewed using additional data and rigorous statistical procedures. This update also included characterization of current water quality. A comprehensive description of the methodology employed is published in the "Final Technical Memorandum for Phase 2A of the Nitrogen-TDS Study" (Wildermuth

[1] Sodium absorption ratio (SAR) = $\dfrac{Na}{[1/2\,(Ca + Mg)]^{1/2}}$

where Sodium (Na), Calcium (Ca) and Magnesium (Mg) are concentrations in milliequivalents per liter

Environmental Inc., July 2000). This effort, coupled with "maximum benefit" demonstrations by certain agencies in the watershed (see further discussion below and in Chapter 5), culminated in the adoption of the TDS and nitrate-nitrogen objectives specified in Table 4-1.

For the most part, the TDS and nitrate-nitrogen water quality objectives for each management zone are based on historical concentrations of TDS and nitrate-nitrogen from 1954 through 1973. This period brackets 1968, when the State Board adopted Resolution No. 68-16, "Policy with Respect to Maintaining High Quality Waters". This Resolution establishes a benchmark for assessing and considering authorization of degradation of water quality. The 20-year period was selected in order to ensure that at least 3 data points in each management zone would be available to calculate historical ambient quality. In general, the following steps were taken to calculate the TDS and nitrate objectives:

a. Annual average TDS and nitrate-nitrogen data from 1954 – 1973 for each well in a management zone were compiled;
b. For each well, the data were statistically analyzed. The mean plus "t" (Student's t) times the standard error of the mean was calculated;
c. A rectangular grid across all management zones was overlaid. Groundwater storage within each grid was computed; and,
d. The volume-weighted TDS and nitrate-nitrogen concentration for each management zone was computed. These concentrations are the calculated historical ambient quality for each zone. [2]

These volume-weighted TDS and nitrate-nitrogen concentrations for each management zone were typically identified as the appropriate objectives. However, it is important to note that if the calculated nitrate-nitrogen concentration exceeded 10 mg/L, the nitrate-nitrogen objective was set to 10 mg/L to be consistent with the primary drinking water standard.

Finally, in some cases, certain agencies proposed alternative, less stringent TDS and nitrate-nitrogen objectives for specific management zones, based on additional consideration of antidegradation requirements and the factors specified in Water Code Section 13241 (see below and Chapter 5). Table 4-1 includes both the historical ambient quality TDS and nitrate-nitrogen objectives (the "antidegradation" objectives) and the objectives based on this additional consideration (the "maximum benefit" objectives) for specific management zones. Chapter 5 specifies detailed requirements pertaining to the implementation of these objectives.

- **Revise the requirements pertaining to Santa Ana River baseflow sampling (p. 4-15) as follows:**

Base flow sampling…. Excerpt, p. 4-15, 4-16.

~~The quantity and quality of base flow is most consistent during the month of August. At that time of year the influence of storm flows and nontributary flows is at a minimum. There is usually no water impounded behind Prado Dam. The volumes of rising water and nonpoint source discharges tend to be low during that time. The major component of base flow in August, therefore, is municipal wastewater. For these reasons, this period has been selected as the time when base flow will be measured and its quality determined. This information will subsequently allow the evaluation of available assimilative capacity, which serves to verify~~

[2] In limited cases, data for ammonia-nitrogen and nitrite-nitrogen as well as nitrate-nitrogen were available and included in the analysis. The ammonia-nitrogen and nitrite-nitrogen values were insignificant. The objectives are thus expressed as nitrate-nitrogen, even where ammonia-nitrogen and nitrite-nitrogen data were included in the analysis.

~~the accuracy of the wasteload allocation. In order to determine whether the water quality and quantity objectives for base flow in Reach 3 are being met, the Regional Board will collect a series of grab and composite samples during August of each year. The results will also be compared with the continuous monitoring data collected by USGS and data from other sources. Additional sampling in Reach 3 will help evaluate the effects of the various constituents of base flow.~~

In order to determine whether the water quality and quantity objectives for base flow in Reach 3 are being met, the Regional Board will collect a series of grab and composite samples when the influence of storm flows and nontributary flows is at a minimum. This typically occurs during August and September. At this time of year, there is usually no water impounded behind Prado Dam. The volumes of storm flows, rising water and nonpoint source discharges tend to be low. The major component of base flow at this time is municipal wastewater. The results of this sampling will be compared with the continuous monitoring data collected by USGS and data from other sources. These data will be used to evaluate the efficacy of the Regional Board's regulatory approach, including the TDS and nitrogen wasteload allocations (see Chapter 5). Additional sampling in Reach 3 by the Board and other agencies will help evaluate the fate and effects of the various constituents of base flow, including the validity of the 50% nitrogen loss coefficient (discussed in Chapter 5).

- **Add the following at the end of Chapter 4 (before Table 4-1)**

Prado Basin Management Zone

As discussed in Chapter 3 – Beneficial Uses, the Prado Basin Management Zone (PBMZ) is generally defined as a surface water feature within the Prado Basin. It is defined by the 566-foot elevation above mean sea level along the Santa Ana River and the four tributaries to the Santa Ana River in the Prado Basin (Chino Creek, Temescal Creek, Mill Creek and Cucamonga Creek). Nitrogen, TDS and other water quality objectives that have been established for these surface waters that flow within the proposed PBMZ are shown in Table 4-1. For the purpose of regulating discharges that would affect the PBMZ and downstream waters, these surface water objectives apply. This application of the existing surface water objectives assures continued water quality and beneficial use protection for waters within and downstream of the PBMZ.

"MAXIMUM BENEFIT" WATER QUALITY OBJECTIVES

As part of the 2004 update of the TDS/Nitrogen Management plan in the Basin Plan, several agencies proposed that alternative, less stringent TDS and/or nitrate-nitrogen water quality objectives be adopted for specific groundwater management zones and surface waters. These proposals were based on additional consideration of the factors specified in Water Code Section 13241 and the requirements of the State's antidegradation policy (State Board Resolution No. 68-16). Since the less stringent objectives would allow a lowering of water quality, the agencies were required to demonstrate that their proposed objectives would protect beneficial uses, and that water quality consistent with maximum benefit to the people of the state would be maintained.

Appropriate beneficial use protection/maximum benefit demonstrations were made by the Chino Basin Watermaster/Inland Empire Utilities Agency, the Yucaipa Valley Water District and the City of Beaumont/San Timoteo Watershed Management Authority to justify alternative "maximum benefit" objectives for the Chino North, Cucamonga, Yucaipa, Beaumont and San Timoteo groundwater management zones. These "maximum benefit" proposals, which are described in detail in Chapter 5 – Implementation, entail commitments by the agencies to implement specific projects and programs. While these agencies' efforts to develop these proposals indicate their strong interest to proceed with these commitments, unforeseen circumstances may impede or preclude it. To address this possibility, this Plan includes both the "antidegradation" and "maximum benefit" objectives for the subject waters (See Table 4-1). Chapter 5 specifies the requirements for implementation of these objectives. Provided that these agencies' commitments are met, then the agencies have demonstrated maximum benefit, and the "maximum benefit" objectives included in Table 4-1 for these waters apply for regulatory purposes. However, if the Regional Board finds that these commitments are not being met and that "maximum benefit" is thus not demonstrated, then the "antidegradation" objectives for these waters will apply. Chapter 5 also describes the mitigation requirements that will apply should discharges based on "maximum benefit" objectives occur unsupported by the demonstration of "maximum benefit".

- **Delete FIGURE 4-1 SANTA ANA REGION GROUNDWATER BASINS (there is no textual reference to this figure)**
- **Delete FIGURE 4-2 SANTA ANA REGION GROUNDWATER BASINS (TDS, mg/L) (there is no textual reference to this figure)**
- **Delete FIGURE 4-3 SANTA ANA REGION GROUNDWATER BASINS (NO_3-**N mg/L) there is no textual reference to this figure)
- **Revise p. 4-30, 4-31, 4-32, 4-38 (Table 4-1 WATER QUALITY OBJECTIVES – INLAND SURFACE STREAMS AND WETLANDS) as shown in the following pages.**
- **Delete pages 4-39 through 4-41, Table 4-1 WATER QUALITY OBJECTIVES - GROUNDWATER SUBBASINS and replace with the following new pages 4-39 through 4-41.**

Table 4-1 WATER QUALITY OBJECTIVES, excerpt, page 4-30, 4-31

INLAND SURFACE STREAMS	Water Quality Objective (mg/L)							HYDROLOGIC UNIT	
	TDS	Hard.	Na	Cl	TIN	SO_4	COD	Primary	Secondary
San Timoteo Area Streams									
San Timoteo Creek									
~~Reach 1 - Santa Ana River Confluence to Gage at San Timoteo Canyon Road~~	~~290~~	~~175~~	~~60~~	~~60~~	~~6~~	~~45~~	~~15~~	~~801.52~~	~~801.53~~
Reach 1A – Santa Ana River Confluence to Barton Road	--	--	--	--	--	--	--	801.52	801.53
Reach 1B – Barton Road to Gage at San Timoteo Canyon Rd. u/s of Yucaipa Valley WD discharge	--	--	--	--	--	--	--	801.52	801.53
Reach 2 - Gage at San Timoteo Canyon Road to Confluence with Yucaipa Creek	~~290~~--	~~175~~--	~~60~~--	~~60~~--	~~6~~--	~~45~~--	~~15~~--	801.52	801.62
Reach 3 - Confluence with Yucaipa Creek to ~~Bunker Hill II Groundwater Subbasin Boundary(T2S/R3W-24)~~ confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)	~~290~~--	~~175~~--	~~60~~--	~~60~~--	~~6~~--	~~45~~--	~~15~~--	801.62	
~~Reach 4 - Bunker Hill II Groundwater Subbasin Boundary (T2S/R3W-24) to Confluence with Little San Gorgonio and Noble Creeks (Headwaters of San Timoteo Creek)~~	~~290~~	~~175~~	~~60~~	~~60~~	~~6~~	~~45~~	~~15~~	~~801.62~~	

\+ Numeric objectives have not been established; narrative objectives apply

** Surface water objectives not established; underlying Management Zone objectives apply. Biological quality protected by narrative objectives

Table 4-1 WATER QUALITY OBJECTIVES, excerpt, page 4-32

INLAND SURFACE STREAMS	Water Quality Objective (mg/L)							HYDROLOGIC UNIT	
	TDS	Hard.	Na	Cl	TIN	SO4	COD	Primary	Secondary
Prado Area Streams									
Chino Creek									
~~Reach 1 – Santa Ana River confluence to beginning of concrete-lined channel south of Los Serranos Rd.~~	~~550~~	~~240~~	~~75~~	~~75~~	~~8~~	~~60~~	~~15~~	~~801.21~~	
Reach 1A – Santa Ana River confluence to downstream of confluence with Mill Creek (Prado Area) – Base Flow *	700	350	110	140	10**	150	30	801.21	
Reach 1B - Confluence of Mill Creek (Prado Area) to beginning of concrete-lined channel south of Los Serranos Rd.	550	240	75	75	8	60	15	801.21	
Reach 2 - Beginning of concrete-lined channel south of Los Serranos Rd. to confluence with San Antonio Creek +								801.21	
Temescal Creek									
~~Reach 1A – Santa Ana River Confluence to Lincoln Ave.~~	~~800~~	~~400~~	~~100~~	~~200~~	~~6~~	~~70~~	~~--~~	~~801.25~~	
Reach 1~~B~~ - Lincoln Ave. to Riverside Canal+	--	--	--	--	--	--	--	801.25	

* Additional objective: Boron 0.75 mg/L
** Total nitrogen, filtered sample
\+ Numeric objectives have not been established; narrative objectives apply

Table 4-1 Water Quality Objectives, excerpt, page 4-38

WETLANDS (INLAND)	Water Quality Objective (mg/L)		HYDROLOGIC UNIT	
	TDS	TIN	Primary	Secondary
San Joaquin Freshwater Marsh** ##	2000	13	801.11	
Shay Meadows+	--	--	801.73	
Stanfield Marsh+**	--	--	801.71	
~~Prado Flood Control Basin **~~ Prado Basin Management Zone @	--	--	~~802.15~~801.21	
San Jacinto Wildlife Preserve+**	--	--	802.21	802.14
Glen Helen+	--	--	801.59	

Additional objective for San Joaquin Freshwater Marsh: COD 90 mg/L.
\+ Numeric objectives have not been established; narrative objectives apply
** This is a created wetlands as defined in the wetlands discussion (see Chapter 3)
@ includes the Prado Flood Control Basin, a created wetland as defined in the wetlands discussion (see chapter 3). Chino Creek, Reach 1A, Chino Creek, 1B, Mill Creek (Prado Area) and Santa Ana River, Reach 3 TDS and TIN numeric objectives apply (see discussion).

Table 4-1 Water Quality Objectives, Page 4-39

Groundwater Management Zones	Water Quality Objective (mg/L)		HYDROLOGIC UNIT	
	TDS	NO_3-N	Primary	Secondary
UPPER SANTA ANA RIVER BASIN				
Big Bear Valley*	220	5.0	801.71	801.73
Beaumont "maximum benefit"++	330	5.0	801.62	801.63, 801.69
Beaumont "antidegradation" ++	230	1.5	801.62	801.63, 801.69
Bunker Hill – A	310	2.7	801.51	801.52
Bunker Hill – B	330	7.3	801.52	801.53, 801.54, 801.57, 801.58
Colton	410	2.7	801.44	801.45
Chino – North "maximum benefit" ++	420	5.0	801.21	481.21, 481.23, 481.22, 801.21, 801.23, 801.24, 801.27
Chino 1– "antidegradation" ++	280	5.0	802.21	481.21
Chino 2 – "antidegradation" ++	250	2.9	801.21	
Chino 3 – "antidegradation" ++	260	3.5	801.21	
Chino – East @	730	10.0	801.21	801.27
Chino – South @	680	4.2	801.21	801.26
Cucamonga "maximum benefit" ++	380	5.0	801.24	801.21
Cucamonga "antidegradation" ++	210	2.4	801.24	801.21
Lytle	260	1.5	801.41	801.42
Rialto	230	2.0	801.41	801.42

* Additional objectives for Bear Valley: Hardness 225 mg/L; Sodium 20 mg/L; Chloride 10 mg/L; Sulfate 20 mg/L

++ "Maximum benefit" objectives apply unless Regional Board determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, "antidegradation" objectives apply (For Chino North, antidegradation objectives for Chino 1, 2, 3 would apply if maximum benefit is not demonstrated). (see discussion in Chapter 5).

@ Chino East and South are the designations in the Chino Basin Watermaster "maximum benefit" proposal (see Chapter 5) for the management zones identified by Wildermuth Environmental, Inc., (July 2000) as Chino 4 and Chino 5, respectively.

Table 4-1 WATER QUALITY OBJECTIVES, page 4-40

Groundwater Management Zones	Water Quality Objective (mg/L)		HYDROLOGIC UNIT	
	TDS	NO_3-N	Primary	Secondary
San Timoteo "maximum benefit" ++	400	5.0	801.62	
San Timoteo "antidegradation" ++	300	2.7	801.62	
Yucaipa "maximum benefit" ++	370	5.0	801.61	801.55,801.54, 801.56, 801.63, 801.65, 801.66, 801.67
Yucaipa "antidegradation" ++	320	4.2	801.61	801.55,801.54, 801.56, 801.63, 801.65, 801.66, 801.67
MIDDLE SANTA ANA RIVER BASIN				
Arlington	980	10	801.26	
Bedford **	--	--	801.32	
Coldwater	380	1.5	801.31	
Elsinore	480	1.0	802.31	
Lee Lake**	--	--	801.34	
Riverside – A	560	6.2	801.27	
Riverside – B	290	7.6	801.27	
Riverside – C	680	8.3	801.27	
Riverside – D	810	10.0	801.27	
Riverside – E	720	10.0	801.27	
Riverside – F	660	9.5	801.27	
Temescal	770	10.0	801.25	

** Numeric objectives not established; narrative objectives apply

++ "Maximum benefit" objectives apply unless Regional Board determines that lowering of water quality is not of maximum benefit to the people of the state; in that case, "antidegradation" objectives would apply (see discussion in Chapter 5).

Table 4-1 WATER QUALITY OBJECTIVES, page 4-41

Groundwater Management Zones	Water Quality Objective (mg/L)		HYDROLOGIC UNIT	
	TDS	NO_3-N	Primary	Secondary
SAN JACINTO RIVER BASIN				
Garner Valley*	300	2.0	802.22	
Idyllwild Area**	--	--	802.22	802.21
Canyon	230	2.5	802.21	
Hemet - South	730	4.1	802.15	802.21
Lakeview – Hemet North	520	1.8	802.14	802.15
Menifee	1020	2.8	802.13	
Perris North	570	5.2	802.11	
Perris South	1260	2.5	802.11	802.12, 802.13
San Jacinto – Lower	520	1.0	802.21	
San Jacinto – Upper	320	1.4	802.21	802.23
LOWER SANTA ANA RIVER BASIN				
La Habra**	--	--	845.62	
Santiago **	--	--	801.12	
Orange	580	3.4	801.11	801.13, 845.61, 801.14
Irvine	910	5.9	801.11	

* Additional objectives for Garner Valley: Hardness 100 mg/L; Sodium 65 mg/L; Chloride 30 mg/L; Sulfate 40 mg/L
** Numeric objectives not established; narrative objectives apply

Chapter 5 Implementation

Page 5-8 ff.: ~~SALT BALANCE AND ASSIMILATIVE CAPACITY – UPPER Santa Ana Basin~~TOTAL DISSOLVED SOLIDS AND NITROGEN MANAGMENT

I. Background

The 1975 and 1983 Basin Plans for the Santa Ana River Basin reported that the most serious problem in the basin was the build up of dissolved minerals, or salts, in the ground and surface waters. Sampling and computer modeling of groundwaters showed that the levels of dissolved minerals, generally expressed as total dissolved solids (TDS) or total filterable residue (TFR), were exceeding water quality objectives, or would do so in the future, unless appropriate controls were implemented. Nitrogen levels in the Santa Ana River, largely in the form of nitrate, were likewise projected to exceed objectives. As was discussed in Chapter 4, high levels of TDS and nitrate adversely affect the beneficial uses of ground and surface waters. The mineralization of the Region's waters, and its impact on beneficial uses, remains a significant problem.

Each use of water adds an increment of dissolved minerals. Significant increments of salts are added by municipal and industrial use, and the reuse and recycling of the wastewater generated as it moves from the hydrologically higher areas of the Region to the ocean. Wastewater and recycled water percolated into groundwater management zones is typically pumped and reused a number of times before reaching the ocean, resulting in increased salt concentrations. ~~These salts may be added to the water as it is used, or t~~The concentration of dissolved minerals can also be increased by ~~reducing the volume, such as by~~ evaporation or evapotranspiration. One of the principal causes of the mineralization problem in the Region is historic irrigated agriculture, particularly citrus, which, in the past, required large applications of water to land, causing large losses by evaporation and evapotranspiration. TDS and nitrate concentrations are increased both by this reduction in the total volume of return water and by the direct application of these salts in fertilizers. Dairy operations, which began in the Region ~~about forty years ago~~ in the 1950's and continue today, also contribute large amounts of salts to the basin. ~~Significant increments of salts have been added by municipal and industrial wastewaters and the reuse and recycling of these waters as they move from the higher areas of the basin towards the ocean. Salts are added as waters are use for municipal or industrial purposes; in some cases, the wastewaters generated were discharged to the same ground water subbasins from which the source waters were derived. These subbasins were then pumped and the water used again, adding additional salts.~~

The implementation chapters of ~~both~~ the 1975 and 1983 Basin Plans focused on recommended plans to address the mineralization problem. The 1975 Plan initiated a total watershed approach to salt source control. Both ~~the 1975 and 1983~~ Plans called for controls on salt loadings from all water uses including residential, commercial, industrial and agricultural (including dairies). The plans included: measures to improve water supply quality, including the import of high quality water from the State Water Project; waste discharge regulatory strategies (e.g., wasteload allocations, allowable mineral increments for uses of water); and recharge projects and other remedial programs to correct problems in specific areas. These Plans also carefully limited reclamation activities and the recycling of wastewaters into the local groundwater basins.

These salt management plans were developed using a complex set of groundwater computer models and programs, known collectively as the Basin Planning Procedure (BPP). ~~For the 1983 Basin Plan, a surface water model, QUAL-II, was used to evaluate quality conditions in the Santa Ana River. Updated and improved versions of these models were used to develop the revised salt management plans specified in this Basin Plan.~~

~~**II.Computer Simulation of the Basin**~~

~~The Basin Planning Procedure, or BPP, is used to project the quality and quantity of groundwaters in the basin given various assumptions about the ways water is supplied and used, and how wastewater is managed. A complex set of data goes into the BPP, including: current and projected landuse information and associated salt loads; population estimates; the location, quantity, and quality of waste discharges; the quantity and quality of water supply sources which are or will be used in the area; data on hydrology, including rainfall and deep percolation of precipitation into underlying groundwater; etc. This and other information is integrated into the BPP to make projections of future quality in each groundwater subbasin. For the upper Santa Ana Basin, the BPP also provides data on the location, quality and quantity of groundwater which rises into the Santa Ana River and becomes part of the River's surface flows.~~

~~The BPP projects where water quality problems will arise unless changes in water quality management are made. Such changes can include revisions in the requirements governing waste discharges, changes in water supply sources and quality, and the implementation of special projects or programs. Alternative management practices and projects are entered into the BPP, the BPP is run, and the effectiveness of the proposed alternatives in addressing identified problems is evaluated. Subsequent runs of the BPP incorporate and assess additional alternatives. Ultimately, a recommended plan for the management of salts in groundwater is developed.~~

The modeling work ~~leading to the development of the 1975 and 1983 Basin plans~~ focused on the upper Santa Ana Basin and, to a ~~smaller~~ lesser extent, on the San Jacinto Basin, where the BPP ~~is~~was less developed and refined. The constituent modeled ~~for~~ in those Plans was TDS.

For ~~this~~ the salt management plan specified initially in the 1995 Basin Plan, when the Plan was adopted and approved in 1994 and 1995, modeling was conducted with the BPP for both the upper Santa Ana and San Jacinto Basins. However, most of the attention was again directed to the upper Santa Ana Basin, for which significant improvements to the BPP were made under a joint effort by the Santa Ana Watershed Project Authority, the Santa Ana River Dischargers Association, the Metropolitan Water District of Southern California, and the Regional Board. The most significant change to the BPP was the addition of a nitrogen modeling component so that projections of the nitrogen (nitrate) quality of groundwaters could be made, in addition to TDS. This enabled the development of a management plan for nitrogen, as well as TDS. ~~The salt management plan for the upper Santa Ana Basin specified in this Basin Plan now addresses the correction and prevention of both nitrogen and TDS groundwater quality problems.~~

The BPP has not been used to model groundwater quality conditions in the lower Santa Ana Basin. For that Basin, the Regional Board's TDS and nitrogen management plans have relied~~s~~, in large part, on the control of the quality of the Santa Ana River flows, which are a major source of recharge in the Basin. As discussed in Chapter 4, most of the baseflow (80-90%) is composed of treated sewage effluent; it also includes nonpoint source inputs and rising groundwater. Baseflow generally provides 70% or more of the water recharged in the Orange County Management Zone. In rare wet years, baseflow accounts for a smaller, but still significant, percentage (40%) of the recharge on an annual basis. Therefore, to protect Orange County groundwater, it is essential to control the quality of baseflow. To do so, baseflow TDS and nitrogen objectives are specified in this Plan for Reach 3 of the River. Wasteload allocations have been established and periodically revised to meet those and other Santa Ana River objectives.

~~The QUAL – II model and its derivatives are used to assess water quality conditions in the Santa Ana River (see below). Other TDS and nitrogen management activities in the lower Santa Ana Basin, conducted principally by the Orange County Water District are described later in this chapter and in Chapter 7.~~

For the 1983 Basin Plan, ~~The~~ QUAL-II, a surface water model~~,~~ developed initially by the US EPA, was calibrated for the Santa Ana River and used to make detailed projections of River quality (TDS and nitrogen) and flow~~. for the 1983 Basin Plan.~~ The model was used to develop wasteload allocations for TDS and nitrogen discharges to the River that were approved as part of that Plan. (Wasteload allocations are discussed in detail in Section III of this Chapter). An updated version of the model, QUAL-2e, was used to revise these wasteload allocations, which were included as part of the initial salt management plan in the 1995 Basin Plan. The models were used to integrate ~~reflects~~ the quantity and quality of inputs to the River from various sources, including the headwaters, municipal wastewater treatment plant discharges, and rising groundwater, based on the water supply and wastewater management plans used in the BPP. Data on rising groundwater quality and quantity ~~is~~ were provided to the QUAL-II/2e models by the BPP. As with the BPP, the QUAL-II/2e model projections ~~are~~ were used to identify water quality problems and to assess the effectiveness of changes in TDS and nitrogen management strategies~~,~~. ~~such as revised waste discharge requirements. The 1983 Basin Plan specified TDS and nitrogen management strategies for the Santa Ana River, known as wasteload allocation, which were developed with this model.~~

~~An improvement version of the model, called QUAL2E, was subsequently developed and calibrated for the Santa Ana River as part of the join BPP improvement effort noted above. This new QUAL2E model is the principal tool used to develop the revised TDS and nitrogen wasteload allocations which are contained in this Basin Plan and which are described in more detail later in this section.~~

~~III.~~ II. Update of the Total Dissolved Solids/Nitrogen Management Plan ~~– Upper Santa Ana Basin~~

The studies conducted to update the TDS/Nitrogen Management Plans in the 1983 and 1995 Basin Plans were not designed to validate or revise the TDS or nitrate-nitrogen objectives for groundwater. Rather, the focus of the studies was to determine how best to meet those established objectives. During public hearings to consider adoption of the 1995 Basin Plan, a number of water supply and wastewater agencies in the region commented that the TDS and nitrate-nitrogen objectives for groundwater should be reviewed, considering the estimated cost of complying with them (several billion dollars). In response, the Regional Board identified the review of these objectives as a high Basin Plan triennial review priority, and stakeholders throughout the Region agreed to provide sufficient resources to perform the necessary studies. ~~After the 1983 Basin Plan was adopted, a number of agencies in the Santa Ana River watershed expressed concerns about certain aspects of the Plan, including the limitations placed on wastewater reclamation and the equity of the wasteload allocations for the Santa Ana River.~~ In December 1995, these agencies, under the auspices of ~~In response, a consortium of agencies, including~~ the Santa Ana Watershed Project Authority (SAWPA),~~the Santa Ana River Dischargers Association (SARDA), the Metropolitan Water District of Southern California (MWD-SC), and the Regional Board, undertook studies to update the Plan for the upper basin [Ref. 1-4].~~ formed the Nitrogen/Total Dissolved Solids (TDS) Task Force (Task Force) to undertake a watershed-wide study (Nitrogen/TDS Study) to review the groundwater objectives and the TDS/Nitrogen Management Plan in the Basin Plan as a whole. SAWPA managed the study, and Risk Sciences and Wildermuth Environmental, Inc., served as project consultants. Major tasks included review of the groundwater subbasin boundaries, development of recommendations for revised boundaries, development of appropriate TDS and nitrate-nitrogen objectives for the subbasins (management zones), and update of the TDS and TIN wasteload allocations to ensure compliance with both the established objectives for the Santa Ana River and tributaries and the recommended groundwater objectives. A complete list of all tasks completed in Phases 1A & 1B and 2A & 2B is included in the Appendix. The Task Force effort resulted in substantive proposed changes to the Basin Plan, including new groundwater management zones (Chapter 3) and new nitrate-nitrogen and TDS objectives for the management zones (Chapter 4). These changes necessitated the update and revision of the TDS/Nitrogen Management Plan, which is described below.

The Task Force studies, including the technical methods employed, are documented in a series of reports (Ref. 1-5). The Task Force studies differed from prior efforts to review the TDS and nitrogen management plans in that the BPP was not utilized. A revised model approach, not involving use of the QUAL-2e model, was used to update the wasteload allocations for the Santa Ana River. The Task Force concluded that the BPP no longer remained a viable tool for water quality planning purposes, and also concluded that the development of a new model was beyond the scope and financial capabilities of the Task Force. The efficacy of modeling to formulate and update salt management plans in this Region has been well demonstrated; in the future, priority should be given to the development of a new model that would assist with future Basin Plan reviews.

~~As already noted, this update effort included substantial improvements to the ground and surface water models. These improved models were then used to evaluate future water quality conditions in the upper basin.~~

~~The modeling work began with the evaluation of a baseline plan, the set of present water supply and wastewater management practices which are extended into the future (to the year 2015) to project water quality and quantity conditions. The baseline plan results indicated where water quality (and quantity) problems would arise if no water quality management changes were made. The findings showed that substantial degradation of the nitrogen and TDS quality of most of the groundwater subbasins in the upper basin would occur over time. Meanwhile, annual sampling of the Santa Ana River at Prado Dam (see Chapter 4) had shown that the nitrogen quality of the River exceeded the objective. These monitoring and modeling results demonstrated that changes were necessary in the TDS and nitrogen management strategy employed in the upper basin.~~

~~A series of alternative TDS and nitrogen management alternatives were then developed and evaluated using the models. A recommended alternative, Alternative 5C, was selected, based on its predicted ability to protect and maintain water quality, and based also on the feasibility and likelihood of its implementation. The projects and plans incorporated in this alternative are described below.~~

~~Additional work with the QUAL2E model was conducted to refine the recommended nitrogen wasteload allocation for the Santa Ana River. Alternative 5C was used as the basis for these additional sensitivity runs. Again, a recommended alternative (Alternative 5C-10) was selected; the nitrogen wasteload allocation specified in this alternative was adopted by the Regional Board on November 15, 1991 (Resolution No. 91-125). This wasteload allocation is also described below.~~

~~IV~~.III. ~~Recommended~~ TDS/Nitrogen Management Plan ~~– Upper Santa Ana basin~~

TDS and nitrogen management in this Region involves both regulatory actions by the Regional Board and actions by other agencies to control and remediate salt problems. Regulatory actions include the adoption of appropriate TDS and nitrogen limitations in requirements issued for waste disposal and municipal wastewater recycling, and the adoption of waste discharge prohibitions. These regulatory steps are described earlier in this Chapter. Actions by other agencies include projects to improve water supply quality and the construction of groundwater desalters and brine lines to remove highly saline wastes from the watershed. The following sections discuss these programs in greater detail.

~~The Recommended TDS/Nitrogen Management Plan (Recommended Plan, or 5C/5C-10) is a composite of plans, projects, assumptions, ongoing programs, and projections, and is therefore very difficult to define succinctly. The closest on can come is to say that the Recommended Plan is the entire package of data which is fed into the models (BPP and QUAL2E) and the products of those models, for the selected alternative. The BPP considers the municipal, industrial, agricultural and other water supplies in the basin, and the available imported water. A Water Supply Plan is developed and is part of the~~

~~Recommended Plan. Similarly, the BPP and QUAL2E consider data on present and projected waste discharges and a Wastewater Management Plan is developed. This too is an essential component of the Recommended Plan. Assumption on hydrology, natural and artificial recharge, replenishment, extraction, and remediation go into the models and become part of the Groundwater Management Plan. These plans – all the assumptions which were included, all the facilities which need to be built – are part of the Recommended Plan. The BPP and QUAL2E, then, are integral parts of this Basin Plan.~~

~~The upper Santa Ana Basin study reports cited previously and the associated task reports and computer printouts specify all the details of 5C and 5C-10. Included here are summary descriptions of the following elements:~~

~~A.Water Supply Plan~~

~~B.Wastewater Management Plan~~

~~C.Groundwater Management Plan~~

~~These descriptions include discussions of the regulatory provisions included in 5C and 5C-10. Other important aspects of the Recommended Plan and its implementation are also discussed. These include the concepts of salt assimilative capacity and of the reasonable use of water, with allowable mineral increments (additions). These factors play a significant role in the Regional Board's issuance of waste discharge requirements. Finally, specific water quality problems and the steps being taken to address them are also summarized.~~

A. Water Supply Quality ~~Plan~~

~~The water supply plan is an essential part of the Recommended Plan.~~ Water supply quality has a ~~plans~~ directly affect on the quality of discharges from municipal wastewater treatment plants, discrete industrial discharges, returns to groundwater from homes using septic tank systems, returns from irrigation of landscaping in sewered and unsewered areas, and returns to groundwater from commercial irrigated agriculture. Water supply quality is an important determinant of the extent to which wastewater can be reused and recycled without resulting in adverse impacts on affected receiving waters. This is particularly true for TDS, since it is a conservative constituent, less likely than nitrogen to undergo transformation and loss as wastewater is discharged or recycled, and typically more difficult than nitrogen to treat and remove. ~~In fact, sensitivity runs using the BPP for projects in the upper Santa Ana watershed show that water supply is the single most important variable in Basin-wide TDS quality management planning.~~

~~This Recommended Plan integrates the water supply systems with the area of use, type of use, salt additions from use, the specific point of discharge after use, reclamation, and downstream uses.~~ Water suppliesy ~~plans~~ cannot be directly regulated by the Regional Board; however, limitations in waste discharge requirements, including ~~and~~ NPDES permits, may necessitate efforts to improve source water quality. These efforts may include drilling new wells, implementing alternative blending strategies, importing higher quality water when it is available, and constructing desalters to create or augment water supplies

~~Limits on TDS and specific mineral constituents are based on consideration of the quality of waters supplied in the discharger's service area and on the quality of the receiving waters and whether or not those waters have assimilative capacity (see below). Detailed water supply plans for the water purveyors and irrigation water distributors in the upper Santa Ana Basin are included in Appendix VI. These include each agency's water supply sources, the quality and quantity of those supplies, and~~

~~allocations of the supplies to municipal, industrial, and agricultural uses within the agency's service area. In a number of cases, water purveyors are also responsible for wastewater treatment and disposal. Water purveyors/wastewater managers are not compelled to follow the water supply plans in this Recommended Plan. However, if a violation of the mineral limits in a discharger's waste discharge requirements occurs or is threatened, the water supply plans for the discharger's service area will be reviewed by Regional Board staff and discussed with this discharger. In these cases, the discharger will be expected to make best efforts to improve the quality of the waters used in the source area and influent to the treatment facility.~~

Imported water supplies are an important part of salt management strategies in the region ~~this Recommended Plan,~~ from both a quantity and quality standpoint. Imported water is needed by many agencies to supplement local sources and satisfy ~~the~~ ever-increasing demands. The import~~ation~~ of high quality State Water Project water, with a long-term TDS average less than 300 mg/L, ~~(water that is low in salt content)~~ is particularly essential. The use of State Water Project water allows maximum reuse of water supplies without aggravating the mineralization problem. It is also used for recharge and replenishment to improve the quality of local water supply sources, which might otherwise be unusable. Thus, the use of high quality State Water Project water in the Region has water supply benefits that extend far beyond the actual quantity imported.

In some cases, the TDS quality of water supplies in a wastewater treatment service area may make it infeasible for the discharger to comply with TDS limits specified in waste discharge requirements. In other cases, the discharger may add chemicals that enable compliance with certain discharge limitations, but also result in TDS concentrations in excess of waste discharge requirements. The Board recognizes these problems and incorporates provisions in waste discharge requirements to address them. These and other aspects of the Board's regulatory program are described next.

~~The water supply plan specifies the quality and quantity of both State Water Project and Colorado River water which is expected to be used in the upper Santa Ana Basin. The plan assumes that the quality of imported water from the State Water Project will be 250mg/L TDS. This value is close to the long-term average for water delivered to this area and the 10-year average in the State Water Project contract. However, in recent drought years, the TDS values were in the 400mg/L range. The plan provides for importing approximately 192,600 acre-feet per year by the year 2000 for use in the upper Santa Ana Basin. Minimum use is about 138,000 acre-feet per year, of which 34,000 is to be used for groundwater replenishment (Table 5-3).~~

~~Table 5-3~~

~~Upper Santa Ana Basin Recommended Plan 5C Imported Water~~

~~Groundwater Replenishment Volume~~

~~Subbasin~~	~~Groundwater Replenishment AF/Y~~
~~San Timoteo~~	~~0~~
~~Lytle Creek~~	~~0~~
~~Bunker Hill Pressure~~	~~0~~
~~Bunker Hill II~~	~~0~~
~~Rialto~~	~~5,000~~

~~Colton~~	~~5,000~~
~~Riverside I~~	~~0~~
~~Riverside II~~	~~0~~
~~Riverside III~~	~~0~~
~~Arlington~~	~~0~~
~~Chino I~~	~~19,000~~
~~Chino II~~	~~0~~
~~Chino III~~	~~0~~
~~Cucamonga~~	~~5,000~~
~~Upper Temescal~~	~~0~~
~~Temescal~~	~~0~~
~~**TOTAL**~~	~~**34,000**~~

B. ~~Wastewater Management Plan~~ TDS and Nitrogen Regulation

~~The recommended wastewater management plan for the upper Santa Ana Basin has a number of components, including wastewater disposal to the ground and surface waters of the upper Santa Ana Basin, export of wastewaters outside the basin, and reclamation. The fundamental philosophy of the recommended plan is to allow a reasonable use of the water supplied, to treat it adequately, and to allow it to flow downstream (or to lower groundwater basins) for reuse.~~

~~Projections of the present and future methods of wastewater disposal and the quantity and quality of the wastewaters are included in the BPP. Details of the individual wastewater management plans of the many municipalities and wastewater entities are included in Appendix VI. In part, these plans are the basis for the Regional Board's development and adoption of waste discharge requirements.~~

~~The contributions of return flows and discharges from agriculture and industry are also included in the BPP, as are those from developed areas which are likely to remain unsewered. Waste discharges in these unsewered areas are governed, in part, by the Regional Board's "Guidelines for Sewage Disposal from Land Developments" [Ref. 5], which are hereby incorporated by reference, and by the Regional Board's minimum lot size requirements for septic system use (see Nonpoint Source section of this chapter). As previously described, waste discharge prohibitions have been established for septic system use in certain areas. These prohibitions are a part of the wastewater management plan (pg. 5-5).~~

~~Those industries which discharge to municipal wastewater facilities (POTWs) are required by the Clean Water Act to develop and implement pretreatment programs which protect the POTWs' treatment processes from shock or upset and which also allow the discharger to comply with their waste discharge requirements (including mineral limits). Another important component of industrial waste management is the use of pipelines to transport brine wastes out of the basin for treatment and disposal to the ocean. There are two such lines in the Region, the Santa Ana Regional Interceptor~~

~~(SARI) and the Chino Basin Non-Reclaimable Line (NRL). Discharges of brines and other mineralized wastewaters to the SARI and NRL are encouraged.~~

As required by the Water Code (Section 13263), the Regional Board must assure that its regulatory actions implement the Basin Plan. Waste discharge requirements must specify limitations that, when met, will assure that water quality objectives will be achieved. Where the quality of the water receiving the discharge is better than the established objectives, the Board must assure that the discharge is consistent with the state's antidegradation policy (SWRCB Resolution No. 68-16). The Regional Board must also separately consider beneficial uses, and where necessary to protect those uses, specify limitations more stringent than those required to meet established water quality objectives. Of course, these obligations apply not only to TDS and nitrogen but also to other constituents that may adversely affect water quality and/or beneficial uses.

As indicated previously, the Regional Board's regulatory program includes the adoption of waste discharge prohibitions. The Board has established prohibitions on discharges of excessively saline wastes and, in certain areas, on discharges from subsurface disposal systems (see "Waste Discharge Prohibitions," above). The Board has also adopted other requirements pertaining to the use of subsurface disposal system use, both to assure public health protection and to address TDS and nitrogen-related concerns. These include the Regional Board's "Guidelines for Sewage Disposal from Land Developments" [Ref. 6], which are hereby incorporated by reference, and the minimum lot size requirements for septic system use (see Nonpoint Source section of this Chapter).

However, the principal TDS and nitrogen regulatory tool employed by the Regional Board is the issuance of appropriate discharge requirements, in conformance with the legal requirements identified above. Several important aspects of th~~e~~is permitting program ~~wastewater management plan~~ warrant additional discussion:

1. Salt assimilative capacity
2. Mineral increments
3. Nitrogen loss coefficients
~~3.~~4. TDS and nitrogen wasteload allocations
~~4.~~5. Wastewater reclamation
6. Special considerations – subsurface disposal systems

1. Salt Assimilative Capacity

~~Because the waters of this Region are reused as they flow from the higher areas of the basin toward the ocean, the concept of a "reasonable use" of the water was developed and included in the 1983 Basin Plan. This concept is also an important part of the TDS (and nitrogen) management strategy in this Basin Plan.~~

~~Most of the so-called biological characteristics (BOD, ammonia, etc.) of wastewater are readily treatable, while many of the inorganic or mineral characteristics are not. For this reason, reasonable use is generally described in terms of mineral additions.~~ Some waters in the Region have assimilative capacity for additions of TDS and/or nitrogen ~~(N)~~; that is, wastewaters with higher TDS/~~N~~nitrogen concentrations than the receiving waters are diluted sufficiently by natural processes, including rainfall or recharge, such that the TDS and nitrogen objectives of the receiving waters are met. The amount of assimilative capacity, if any, varies ~~widely,~~ depending on the individual characteristics of the waterbody in question.

~~A number of factors were considered in determining which waterbodies in the upper Santa Ana Basin do not have assimilative capacity for TDS and/or nitrogen inputs. For groundwaters, the results of the BPP for the Recommended Plan (5C) were used initially. The year 2010[1] quality (TDS and nitrate) projections for each subbasin were compared to their respective subbasin objectives to determine whether the objectives would be met and whether there was any evidence of degradation. Also considered was the existing quality of the subbasins, as shown by the BPP input data and recent field studies. This evidence was reviewed in light of the Regional Board's knowledge of a number of additional factors, including: the past, present, and future waste loads to each subbasin; subbasin hydrology; and the uncertainties associated with modeling procedures. Based on considerations of these factors, the following subbasins in the upper Santa Ana Basin lack assimilative capacity for TDS:~~

~~Bunker Hill II and Pressure~~
~~Riverside I~~
~~Colton~~
~~Rialto~~
~~Chino II and III~~

~~The following subbasins lack assimilative capacity for nitrogen:~~

~~Bunker Hill I, II, and Pressure~~
~~Colton~~
~~Rialto~~
~~Riverside I, II, and III~~
~~Temescal~~
~~Chino II, and III~~

~~The remaining subbasins in the upper Santa Ana Basin have assimilative capacity for TDS and nitrogen. However, these findings of assimilative capacity are contingent on the actual implementation of the Recommended Plan, according to the schedule provided therein. That is assimilative capacity exists in the remaining subbasins if and only if the quantity and quality of waste loads and methods of disposal, the quantity and quality of water supplies, groundwater management projects (see below), and other components of the Recommended Plan are implemented. If these measures are not implemented, the Regional Board will reconsider its findings of assimilative capacity.~~

The adoption of new groundwater management zone boundaries (Chapter 3) and new TDS and nitrate-nitrogen objectives for these management zones (Chapter 4), pursuant to the work of the Nitrogen/TDS Task Force, necessitated the re-evaluation of the assimilative capacity findings initially incorporated in the 1995 Basin Plan. To conduct this assessment, the Nitrogen-TDS study consultant calculated current ambient TDS and nitrate-nitrogen water quality using the same methods and protocols as were used in the calculation of historical ambient quality (see Chapter 4). The analysis focused on representing current water quality as a 20-year average for the period from 1978 through 1997. [Ref. 1]. For each management zone, current TDS and nitrate-nitrogen water quality were compared to water

~~1 The planning period evaluated by the BPP extended to the year 2015. The water supply and wastewater management practices assumed for the year 2010 were simply extended to the year 2015. Given the uncertainties about such long-range projections, Regional Board staff determined that the use of the year 2010 projections would be more appropriate for the determination of assimilative capacity. Findings with respect to assimilative capacity will be reviewed again in the future.~~

quality objectives (historical water quality)[2]. Assimilative capacity was also assessed relative to the "maximum benefit" objectives established for certain management zones. If the current quality of a management zone is the same as or poorer than the specified water quality objectives, then that management zone does not have assimilative capacity. If the current quality is better than the specified water quality objectives, then that management zone has assimilative capacity. The difference between the objectives and current quality is the amount of assimilative capacity available.

Tables 5-3 and 5-4 show the water quality objectives and the current ambient quality for TDS and nitrate-nitrogen, respectively, for each management zone. These tables also list the TDS and nitrate-nitrogen assimilative capacity of the management zones, if any. Of the thirty-seven (37) management zones, twenty-seven (27) lack assimilative capacity for TDS, and thirty (30) lack assimilative capacity for nitrate-nitrogen (this assumes the "maximum benefit" objectives are in effect). There are five (5) management zones for which there were insufficient data to calculate TDS and/or nitrate-nitrogen water quality objectives and, therefore, assimilative capacity. For regulatory purposes, these 5 management zones are assumed to have no assimilative capacity. Dischargers to these management zones may demonstrate that assimilative capacity for TDS and/or nitrate-nitrogen is available. If the Regional Board approves this demonstration, then the discharger would be regulated accordingly.

As indicated in Table 5-3, it will be assumed for most regulatory purposes that there is no assimilative capacity for TDS in the Orange County groundwater management zone. The 20 mg/L of management zone-wide TDS assimilative capacity calculated for this zone will be allocated to discharges resulting from groundwater remediation and other legacy contaminant removal projects implemented within the Orange County Management Zone.

Tables 5-3 and 5-4 show the assimilative capacity available in management zones for which "maximum benefit" objectives have been specified. As described in Chapter 4 and later in this Chapter, the application of these objectives is contingent on the implementation of certain projects and programs by specific dischargers as part of their maximum benefit demonstrations. Assimilative capacity created by these projects/programs will be allocated to the party(-ies) responsible for implementing them.

Chapter 3 delineates the Prado Basin Management Zone, and Chapter 4 identifies the applicable TDS and nitrogen objectives for this Zone (the objectives for the surface waters that flow in this Zone). No assimilative capacity exists in this zone.

These assimilative capacity findings are significant from a regulatory perspective. ~~Water Code Section 13263 requires that waste discharge requirements implement relevant water quality control plans (basin plans). Therefore, waste discharge requirements must be related directly to water quality objectives in the Basin Plan.~~ If there is assimilative capacity in the receiving waters for TDS, nitrogen or other constituents, ~~the~~ a ~~allowed~~ waste discharge may be of ~~lower~~ poorer quality than the objectives for those constituents for the receiving waters, as long as the discharge does not cause violation of the objectives and provided that antidegradation requirements are met. However, if there is no assimilative capacity in the receiving waters, such as the management zones ~~subbasins identified above~~identified in Tables 5-3 and 5-4, the numerical limits in the discharge requirements

[2] As noted in Chapter 4, ammonia-nitrogen and nitrite-nitrogen data were also included in the analysis, where available. This occurred for a very limited number of cases and ammonia-nitrogen and nitrite-nitrogen concentrations were insignificant.

cannot exceed the receiving water objectives or the degradation process would be accelerated.[3] This rule was expressed clearly by the State Water Resources Control Board in a decision regarding the appropriate TDS discharge limitations for the Rancho Caballero Mobilehome park located in the Santa Ana Region (Order No. 73-4, the so called "Rancho Caballero decision") [Ref. ~~6~~7]. However, this rule is not meant to restrict overlying agricultural irrigation, or similar activities, such as landscape irrigation. Even in management zones ~~subbasins~~ without assimilative capacity, groundwater may be pumped, ~~and~~ used for agricultural purposes in the area and returned to the management zone from which it originated.

In regulating waste discharges to waters with assimilative capacity, the Regional Board will proceed as follows. (see also Section III.B.6., Special Considerations – Subsurface Disposal Systems).

If a discharger proposes to discharge wastes that are at or below (i.e., better than) the current ambient TDS and/or nitrogen water quality, then the discharge will not be expected to result in the lowering of water quality, and no antidegradation analysis will be required. TDS and nitrogen objectives are expected to be met. Such discharges clearly implement the Basin Plan and the Board can permit them to proceed. Of course, other pertinent requirements, such as those of the California Environmental Quality Act (CEQA) must also be satisfied. For groundwater management zones, current ambient quality is as defined in Table 5-3 and Table 5-4, or as these Tables may be revised (through the Basin Plan amendment process) pursuant to the detailed monitoring program to be conducted by dischargers in the watershed (see Section V., Salt Management Plan – Monitoring Program Requirements).

If a discharger proposes to discharge wastes that exceed the current ambient TDS and/or nitrogen quality, then the Board will require the discharger to conduct an appropriate antidegradation analysis. The purpose of this analysis will be to demonstrate whether and to what extent the proposed discharge would result in a lowering of ambient water quality in affected receiving waters. That is, to what extent, if any, would the discharge use available assimilative capacity. If the discharger demonstrates that no lowering of water quality would occur, then antidegradation requirements are met, water quality objectives will be achieved, and the Regional Board can permit such discharges to proceed. If the analysis indicates that a lowering of current ambient water quality would occur, other than on a minor or temporally or spatially limited basis, then the discharger must demonstrate that: (1) beneficial uses would continue to be protected and the established water quality objectives would be met; and (2) that the resultant water quality would be consistent with maximum benefit to the people of California; and, (3) that best practicable treatment or control has been implemented. Best practical treatment or control means levels that can be achieved using best efforts and reasonable control methods. For affected receiving waters, the discharger must estimate the amount of assimilative capacity that would be used by the discharger. The Regional Board would employ its discretion in determining the amount of assimilative capacity that would be allocated to the discharger. Rather than allocating assimilative capacity, the Regional Board may require the discharger to mitigate or offset discharges that would result in the lowering of water quality.

Again, discharges to waters without assimilative capacity for TDS and/or nitrogen must be held to the objectives of the affected receiving waters (with the caveat identified in footnote 3 below). In some cases, compliance with ~~subbasin~~ management zone TDS objectives for discharges to waters without

[3] A discharger may conduct analyses to demonstrate that discharges at levels higher than the objectives would not cause or contribute to the violation of the established objectives. See, for example, the discussion of wasteload allocations for discharges to the Santa Ana River and its tributaries (Section III. B. 4.) If the Regional Board approves this demonstration, then the discharger would be regulated accordingly.

assimilative capacity may be difficult to achieve. Poor quality water supplies or the need to add certain salts ~~in~~during the treatment process to achieve compliance -with other discharge limitations (e.g., addition of ferric chloride) could render compliance with strict TDS limits ~~impossible~~ very difficult. The Regional Board addresses such situations by providing dischargers with the opportunity to participate in TDS offset programs, such as the use of desalters, in lieu of compliance with numerical TDS limits. These offset provisions are incorporated into waste discharge requirements. Provided that the discharger takes all reasonable steps to improve the quality of the waters influent to the treatment facility (such as through source control or improved water supplies), and provided that chemical additions are minimized, the discharger can proceed with an acceptable program to offset the effects of TDS discharges in excess of the permit limits.

Similarly, compliance with the nitrate-nitrogen objectives for groundwaters specified in this Plan would be difficult in many cases. ~~These objectives, which were established in 1975 based on the relatively data available at the time, are generally very low concentrations, most below the drinking water standard. In adopting the wasteload allocation for total inorganic nitrogen, which is described in detail in the next section, the Regional Board specified that nitrogen discharges to the groundwaters of the upper Santa Ana Basin be held to 10mg/L (total inorganic nitrogen).~~ Offset provision may apply to nitrogen discharges as well.

An alternative that dischargers might pursue in these circumstances is revision of the TDS or nitrogen objectives, through the Basin Plan amendment process. Consideration of less stringent objectives would necessitate comprehensive antidegradation review, including the demonstrations that beneficial uses would be protected and that water quality consistent with maximum benefit to the people of the State would be maintained. As discussed in Chapter 4 and later in this Chapter, a number of dischargers have pursued this "maximum benefit objective" approach, leading to the inclusion of "maximum benefit" objectives and implementation strategies in this Basin Plan. Discharges to areas where the "maximum benefit" objectives apply will be regulated in conformance with these implementation strategies. Any assimilative capacity created by the maximum benefit programs will be allocated to the parties responsible for implementing them.

~~The Santa Ana River lacks assimilative capacity for nitrogen inputs, as shown by violation if its nitrogen objective at Prado Dam. This problem is addressed through the implementation of the total inorganic nitrogen wasteload allocation (see section 3).~~

~~The TDS objective for the River at Prado Dam is being met as a result of the implementation of a TDS wasteload allocation (also described in section 3). This Plan incorporates a revised TDS wasteload allocation to ensure continued compliance with the objective.~~

Table 5-3
Total Dissolved Solids (TDS) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
UPPER SANTA ANA RIVER BASIN			
Beaumont – "max benefit" [3]	330	290	40
Beaumont – "antideg"	230	290	None
Bunker Hill A	310	350	None
Bunker Hill B	330	260	70
Colton	410	430	None
Chino North – "max benefit"	420	300	120
Chino 1 – "antideg"	280	310	None
Chino 2 – "antideg"	250	300	None
Chino 3 – "antideg"	260	280	None
Chino South	680	720	None
Chino East	730	760	None
Cucamonga – "max benefit" [3]	380	260	120
Cucamonga – "anti-deg"	210	260	None
Lytle	260	240	20
Rialto	230	230	None
San Timoteo – "max benefit" [3]	400	300	100
San Timoteo – "anti-deg"	300	300	None
Yucaipa – "max benefit" [3]	370	330	40
Yucaipa – "antideg"	320	330	None
MIDDLE SANTA ANA RIVER BASIN			
Arlington	980	--[1]	None
Bedford	--[1]	--[1]	None
Coldwater	380	380	None
Elsinore	480	480	None
Lee Lake	--[1]	--[1]	None
Riverside A	560	440	120
Riverside B	290	320	None
Riverside C	680	760	None
Riverside D	810	--[1]	None
Riverside E	720	720	None
Riverside F	660	580	80
Temescal	770	780	None
Warm Springs	--[1]	--[1]	None
SAN JACINTO RIVER BASINS			
Canyon	230	220	10
Hemet South	730	1030	None
Lakeview – Hemet North	520	830	None
Menifee	1020	3360	None
Perris North	570	750	None
Perris South	1260	3190	None
San Jacinto Lower	520	730	None
San Jacinto Upper	320	370	None
LOWER SANTA ANA RIVER BASINS			
Irvine	910	910	None
La Habra	--[1]	--[1]	None
Orange County[2]	580	560	None[2]
Santiago	--[1]	--[1]	None

[1] Not enough data to estimate TDS concentrations; management zone is presumed to have no assimilative capacity. If assimilative capacity is demonstrated by an existing or proposed discharger, that discharge would be regulated accordingly.

[2] For the purposes of regulating discharges other than those associated with projects implemented within the Orange County Management Zone to facilitate remediation projects and/or to address legacy contamination, no assimilative capacity is assumed to exist.

[3] Assimilative capacity created by "maximum benefit" objectives is allocated solely to agency(ies) responsible for "maximum benefit" implementation (see Section VI.).

Table 5-4
Nitrate Nitrogen (NO_3-N) Assimilative Capacity Findings

Management Zone	Water Quality Objective (mg/L)	Current Ambient (mg/L)	Assimilative Capacity (mg/L)
UPPER SANTA ANA RIVER BASINS			
Beaumont – "max benefit" [3]	5.0	2.6	2.4
Beaumont – "antideg"	1.5	2.6	None
Bunker Hill A	2.7	4.5	None
Bunker Hill B	7.3	5.5	1.8
Colton	2.7	2.9	None
Chino North – "max benefit" [3]	5.0	7.4	None
Chino 1 – "antideg"	5.0	8.4	None
Chino 2 – "antideg"	2.9	7.2	None
Chino 3 – "antideg"	3.5	6.3	None
Chino South	4.2	8.8	None
Chino East	10	29.1	None
Cucamonga – "max benefit" [3]	5.0	4.4	0.6
Cucamonga – "anti-deg"	2.4	4.4	None
Lytle	1.5	2.8	None
Rialto	2.0	2.7	None
San Timoteo – "max benefit" [3]	5.0	2.9	2.1
San Timoteo – "anti-deg"	2.7	2.9	None
Yucaipa – "max benefit" [3]	5.0	5.2	None
Yucaipa – "antideg"	4.2	5.2	None
MIDDLE SANTA ANA RIVER BASINS			
Arlington	10.0	--[1]	None
Bedford	--[1]	--[1]	None
Coldwater	1.5	2.6	None
Elsinore	1.0	2.6	None
Lee Lake	--[1]	--[1]	None
Riverside A	6.2	4.4	1.8
Riverside B	7.6	8.0	None
Riverside C	8.3	15.5	None
Riverside D	10.0	--[1]	None
Riverside E	10.0	14.8	None
Riverside F	9.5	9.5	None
Temescal	10.0	13.2	None
Warm Springs	--[1]	--[1]	None
SAN JACINTO RIVER BASINS			
Canyon	2.5	1.6	0.9
Hemet South	4.1	5.2	None
Lakeview – Hemet North	1.8	2.7	None
Menifee	2.8	5.4	None
Perris North	5.2	4.7	0.5
Perris South	2.5	4.9	None
San Jacinto Lower	1.0	1.9	None
San Jacinto Upper	1.4	1.9	None
LOWER SANTA ANA RIVER BASINS			
Irvine	5.9	7.4	None
La Habra	--[1]	--[1]	None
Orange County	3.4	3.4	None
Santiago	--[1]	--[1]	None

[1] Not enough data to estimate nitrate nitrogen concentrations
[2] Assimilative capacity created by "maximum benefit" objectives is allocated solely to agency(ies) responsible for "maximum benefit" implementation (see Section VI.).

2. Mineral Increments

The fundamental philosophy of TDS management plans in Santa Ana Region Basin Plans to date has been to allow a reasonable use of the water, to treat the wastewater generated appropriately, and to allow it to flow downstream (or to lower groundwater basins) for reuse. "Reasonable use" is defined in terms of appropriate mineral increments that can be applied to water supply quality in setting discharge limitations.

The Department of Water Resources has recommended values for the maximum use incremental additions of specific ions ~~and characteristics which~~ that should be allowed through use, based on detailed study of water supplies and wastewater quality in the Region [Ref. ~~7~~8]. Their recommendations are as follows:

Sodium	70 mg/L
Sulfate	40 mg/L
Chloride	65 mg/L
TDS	250 mg/L
Total Hardness	30 mg/L

These mineral increments ~~have been in effect since the late 1960s and~~ were ~~also~~ incorporated into the 1983 Basin Plan. They will be incorporated into waste discharge requirements when ~~as~~ appropriate and necessary.

3. Nitrogen Loss Coefficients

The Regional Board's regulatory program has long recognized that some nitrogen transformation and loss can occur when wastewater is discharged to surface waters or reused for landscape irrigation. For example, the Total Inorganic Nitrogen (TIN) wasteload allocation adopted for the Santa Ana River in 1991 included unidentified nitrogen losses in the surface flows in Reach 3 of the River. Waste discharge requirements have allowed for nitrogen losses due to plant uptake when recycled water is used for irrigation.

In contrast, nitrogen has been considered a conservative constituent in the subsurface, not subject to significant transformation or loss, and no such losses have been identified or assumed for regulatory purposes.

One of the tasks included in the Nitrogen/TDS Task Force studies leading to the 2004 update of the N/TDS Management Plan was the consideration of subsurface transformation and loss. One objective of this task was to determine whether dischargers might be required to incur costs for additional treatment to meet the new groundwater management zone nitrate-nitrogen objectives (Chapter 4), or whether natural, subsurface nitrogen losses could achieve any requisite reductions. The second objective was to develop a nitrogen loss coefficient that could be used with certainty to develop appropriate limits for nitrogen discharges throughout the Region.

To meet these objectives, the Nitrogen/TDS study consultant, Wildermuth Environmental, Inc. (WEI), evaluated specific recharge operations (e.g., the Orange County Water District recharge ponds overlying the Orange County Forebay), wastewater treatment wetlands (e.g., the Hidden Valley Wildlife Area, operated by the City of Riverside) and Santa Ana River recharge losses (for the Santa Ana River, water quality in reaches where recharge is occurring ("losing" reaches) was compared with local well data). In each case, WEI evaluated long-term (1954 to 1997) nitrogen surface water quality data and compared those values to long-term nitrogen data for adjacent wells.

Based on this evaluation, a range of nitrogen loss coefficients was identified. [Ref. 1] In light of this variability, the N/TDS Task Force recommended that a conservative approach to be taken in establishing a loss coefficient. The Task Force recommended that a region-wide default nitrogen loss of 25% be applied to all discharges that affect groundwater in the Region. The Task Force also recommended that confirmatory, follow-up monitoring be required when a discharger requested and was granted the application of a nitrogen loss coefficient greater than 25%, based on site-specific data submitted by that discharger.

The City of Riverside also presented data to the Task Force regarding nitrogen transformation and losses associated with wetlands. These data support a nitrogen loss coefficient of 50%, rather than 25%, for the lower portions of Reach 3 of the Santa Ana River that overlie the Chino South groundwater management zone. [Ref. 9]. In fact, the data indicate that nitrogen losses from wetlands in this part of Reach 3 can be greater than 90%. However, given the limited database, the Task Force again recommended a conservative approach, i.e., 50% in this area, with confirmatory monitoring.

The 25% and, where appropriate, 50% nitrogen loss coefficients will be used in developing nitrogen discharge limits. These coefficients will be applied to discharges that affect groundwater management zones with and without assimilative capacity.

For discharges to groundwater management zones with assimilative capacity, the TIN discharge limitation would be calculated as follows:

TIN Discharge Limit (mg/) = management zone nitrate-nitrogen current ambient water quality
(1- nitrogen loss coefficient)

The Regional Board will employ its discretion in specifying a higher TIN limit that would allocate some of the available assimilative capacity.

For discharges to groundwater management zones without assimilative capacity, the TIN discharge limitation would be calculated as follows:

TIN Discharge Limit (mg/) = management zone nitrate-nitrogen water quality objective
(1- nitrogen loss coefficient)

These coefficients do not apply to discharges specifically addressed by the TIN wasteload allocation, described in the next section, since surface and subsurface nitrogen losses were accounted for in developing this allocation.

~~3.~~4. TDS and Nitrogen Wasteload Allocations for the Santa Ana River

Wasteload allocations for regulating discharges of TDS and total inorganic nitrogen (TIN) to the Santa Ana River, and thence to groundwater management zones recharged by the River, are ~~another~~ an important component of ~~the wastewater~~ salt management ~~plan~~ for the ~~upper~~ Santa Ana Basin. As described earlier, the Santa Ana River is a significant source of recharge to groundwater management zones underlying the River and, downstream, to the Orange County ground~~-~~water ~~basin. Therefore, the~~basin. The quality of the River thus has a significant effect on the quality of the Region's groundwater, which is used by more than 5 million people. Control of River quality is appropriately one of the Regional Board's highest priorities. ~~that groundwater and must be properly controlled.~~

~~As described earlier, s~~Sampling and modeling analyses conducted in the 1980's and early 1990's indicated that the TDS and total nitrogen ~~two~~ water quality objectives for the Santa Ana River~~, those for TDS and total nitrogen,~~ were being violated or were in danger of being violated. Under the Clean Water Act (Section 303(d)(1)(c); 33 USC 466 *et seq*.), violations of water quality objectives for surface waters must be addressed by the calculation of the maximum wasteloads ~~which~~ that can be discharged to achieve and maintain compliance. Accordingly, TDS and nitrogen wasteload allocations were developed and included in the 1983 Basin Plan. The nitrogen wasteload allocation was updated in 1991; an updated TDS wasteload allocated was included in the 1995 Basin Plan when it was adopted and approved in 1994/1995. ~~Revised wasteload allocations for these constituents are included in this Plan.~~

The wasteload allocations distribute a share of the total TDS and TIN ~~nitrogen~~ wasteloads ~~to the River~~ to each of the discharges to the River or its tributaries. The allocations are implemented principally through TDS and nitrogen limits in waste discharge requirements issued to municipal wastewater treatment facilities (Publicly Owned Treatment Works or POTWs) ~~which~~ that discharge to the River, either directly or indirectly[4]. Nonpoint source inputs of TDS and nitrogen to the River are also considered in the development of these wasteload allocations. Controls on these inputs are more difficult to identify and achieve and may be ~~. In part, these controls are~~ addressed ~~via the Groundwater Management Plan (below), and~~ through the areawide stormwater permits issued to the counties by the Regional Board or through other programs. For example, the Orange County Water District has constructed and operates more than 400 acres of wetlands ponds in the Prado Basin Management Zone to remove nitrogen in flows diverted from, and then returned to, the Santa Ana River.

Because of the implementation of these wasteload allocations, the Orange County Water District wetlands and other measures, the TDS and TIN water quality objectives for the Santa Ana River at Prado Dam are no longer being violated, as shown by annual sampling of the River at the Dam by Regional Board staff [Ref. 10A]. However, as part of the Nitrogen/TDS Task Force studies to update the TDS/nitrogen management plan for the Santa Ana Basin, a review of the TDS and TIN wasteload allocations initially contained in this Basin Plan was conducted. In part, this review was necessary in light of the new groundwater management zones and TDS and nitrate-nitrogen objectives for those zones recommended by the N/TDS Task Force (and now incorporated in Chapters 3 and 4). The wasteload allocations were evaluated and revised to ensure that the POTW discharges would assure compliance with established surface water objectives and would not cause or contribute to violation of the groundwater management zone objectives. The Task Force members also recognized that this evaluation was necessary to determine the economic implications of assuring conformance with the new management zone objectives. Economics is one of the factors that must be considered when establishing new objectives (Water Code Section 13241).

WEI performed the wasteload allocation analysis for both TDS and TIN [Ref. 3, 5]. In contrast to previous wasteload allocation work, the QUAL-2e model was not used for this analysis. Further, the Basin Planning Procedure (BPP) was not used to provide relevant groundwater data. Instead, WEI developed a projection tool using a surface water flow/quality model and a continuous-flow stirred-tank reactor (CFSTR) model for TDS and TIN. The surface water Waste Load Allocation Model (WLAM) is organized into two major components – RUNOFF (RU) and ROUTER (RO). RU computes runoff from the land surface and RO routes the runoff estimated with RU through the drainage system in the upper Santa Ana watershed. Both the RU and RO models contain hydrologic, hydraulic and water quality components.

To ensure that all hydrologic regimes were taken into account, hydrologic and land use data from 1950 through 1999 were used in the analysis. The analysis took into account the TDS and nitrogen quality of wastewater discharges, precipitation and overland runoff, instream flows and groundwater.

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[4] With some exceptions that may result from groundwater pumping practices, t~~T~~he ground and surface waters in the upper Santa Ana Basin (upstream of Prado Dam) eventually enter the Santa Ana River and flow through Prado Dam. Discharges to these waters will therefore eventually affect the quality of the River and must be regulated so as to protect both the immediate receiving waters and other affected waters, including the River.

Off-stream and in-stream percolation rates, rising groundwater quantity and quality, and the 25% and 50% nitrogen loss coefficients described in the preceding section were also factored into the analysis. The purpose of the modeling exercise was to estimate discharge, TDS and TIN concentrations in the Santa Ana River and tributaries and in stream bed recharge. These data were then compared to relevant surface and groundwater quality objectives to determine whether changes in TDS and TIN regulation were necessary.

Discharges from POTWs to the Santa Ana River or its tributaries were the focus of the analysis. POTW discharges to percolation ponds were not considered. The wasteload allocation analysis assumed, correctly, that these direct groundwater discharges will be regulated pursuant to the management zone objectives, findings of assimilative capacity and nitrogen loss coefficients identified in Chapter 4 and earlier in this Chapter.

The surface waters evaluated included the Santa Ana River, Reaches 3 and 4, Chino Creek, Cucamonga/Mill Creek and San Timoteo Creek. Management zones that are directly under the influence of these surface waters and that receive wastewater discharges were evaluated. These included the San Timoteo, Riverside A, Chino South, and Orange County Management Zones[5]. In addition, wastewater discharges to the Prado Basin Management Zone were also evaluated.

WEI performed three model evaluations in order to assess wasteload allocation scenarios through the year 2010. These included a "baseline plan" and two alternative plans ("2010-A" and "2010-B"). The baseline plan generally assumed the TDS and TIN limits and design flows for POTWs specified in waste discharge requirements as of 2001. These limits implemented the wasteload allocations specified in the 1995 Basin Plan when it was approved in 1995. A TDS limit of 550 mg/L was assumed for the Rapid Infiltration and Extraction Facility (RIX) and the analysis assumed a 540 mg/L TDS for the City of Beaumont. The baseline plan also assumed reclamation activities at the level specified in the 1995 Basin Plan, when it was approved. The purpose of the baseline plan assessment was to provide an accurate basis of comparison for the results of evaluation of the two alternative plans. For alternative 2010-A, it was generally assumed that year 2001 discharge effluent limits for TDS and TIN applied to POTW discharges, but projected year 2010 surface water discharge amounts were applied. TDS limits of 550 mg/L and 540 mg/L were again assumed for RIX and the City of Beaumont discharges. The same limited reclamation and reuse included in the baseline plan was assumed (see Table 5-7 in Section III.B.5.). For alternative 2010-B, POTW discharges were also generally limited to the 2001 TDS and TIN effluent limits (RIX was again held to 550 mg/L and Beaumont to 540 mg/L). However, in this case, large increases in wastewater recycling and reuse were assumed (Table 5-7), resulting in the reduced surface water discharges projected for 2010.

Analysis of the model results demonstrated that the TDS and nitrogen objectives of affected surface waters would be met and that water quality consistent with the groundwater management zone objectives would be achieved under both alternatives. It is likely that water supply and wastewater agencies will implement reclamation projects with volumes that are in the range of the two alternatives. The wasteload allocations would be protective throughout the range of surface water discharges identified. The year 2010 flow values are not intended as limits on POTW flows; rather, these flows were derived from population assumptions and agency estimates and are used in the models for quality projections. Surface water discharges significantly different than those projected

[5] The City of Beaumont discharges to Coopers Creek in a subunit of the Beaumont Management Zone. However, for analytical and regulatory purposes, it is considered a discharge to the San Timoteo Management Zone since it enters that Management Zone essentially immediately. Recharge of wastewater discharges by YVWD and Beaumont in downgradient management zones that may be affected by surface water discharges (e.g., Bunker Hill B, Colton), is not expected to be significant. Therefore, these management zones were not evaluated as part of the wasteload allocation analysis.

will necessitate additional model analyses to confirm the propriety of the allocations.

The wasteload allocations for TDS and TIN are specified in Table 5-5. Allocations based on the 2010-A and 2010-B alternatives are shown for both TDS and TIN to reflect the expected differences in surface water discharge flows that would result from variations in the amount of wastewater recycling actually accomplished in the Region. As shown in this Table, irrespective of these differences, the TDS and TIN allocations remain the same.

It is essential to point out that the wasteload allocations in Table 5-5 will be not be used to specify TDS and TIN effluent limitations for wastewater recycling (reuse for irrigation) and recharge by the listed POTWs, but will be applied only to the surface water discharges by these POTWs to the Santa Ana River and its tributaries. TDS and TIN limitations for wastewater recycling and recharge by these POTWs will be based on the water quality objectives for affected groundwater management zones or, where appropriate, surface waters. These limitations are likely to be different than the wasteload allocations specified in Table 5-5.

For most dischargers, the allocations specified in Table 5-5 are the same as those specified in the prior 1995 Basin Plan TDS and TIN wasteload allocations. However, for certain dischargers, two sets of TDS and TIN wasteload allocations are shown in Table 5-5. One set is based on the assumption that the "maximum benefit" objectives defined in Chapter 4 for the applicable groundwater management zones are in effect. The other set of wasteload allocations applies if maximum benefit is not demonstrated and the antidegradation objectives for these management zones are therefore in effect. Maximum benefit implementation is described in Section VI. of this Chapter.

In addition, in contrast to the prior wasteload allocations, a single wasteload allocation for TDS and TIN that would be applied on a flow-weighted average basis to all of the treatment plants operated by the Inland Empire Utilities Agency as a whole is specified. These allocations are based on the water quality objectives for Chino Creek, Reach 1B (550 mg/L TDS and 8 mg/L TIN), to which the IEUA discharges occur, directly or indirectly. As described in Section VI, IEUA proposes to implement a "maximum benefit" program to support the implementation of the "maximum benefit" TDS and nitrate-nitrogen objectives for the Chino North and Cucamonga Management Zones. Separate "maximum benefit" and "antidegradation" wasteload allocations are not necessary for IEUA, as they are for YVWD and Beaumont. This is because the IEUA wasteload allocations are based solely on the Chino Creek objectives and are not contingent on "maximum benefit" objectives or implementation. The IEUA surface water discharges do not affect the groundwater management zones for which "maximum benefit" objectives are to be implemented.

Finally, the TDS wasteload allocation for the RIX facility is less stringent (550 mg/L) than the prior wasteload allocation. The new allocation will assure beneficial use protection and will not result in a significant lowering of water quality. As such, it is consistent with antidegradation requirements. Given this, the less stringent effluent limitation can be specified pursuant to the exception to the prohibition against backsliding established in the Clean Water Act, Section 303(d)(4)(a).

In most cases, the surface water discharges identified in Table 5-5 will affect or have the potential to affect groundwater management zones without assimilative capacity for TDS and/or nitrogen. As discussed earlier in this section, the lack of assimilative capacity normally dictates the application of the water quality objectives of the affected receiving waters as the appropriate waste discharge limitations. However, as shown in Table 5-5, the TIN and, in some cases, TDS wasteload allocations for these discharges exceed the objectives for these management zones. This is because the wasteload allocation analysis conducted by WEI demonstrated that POTW discharges at these higher-than-objective levels will not result in violations of the TDS and nitrate-nitrogen objectives of the affected management zones, or surface waters. Accordingly, these wasteload allocations will be used for surface water discharge regulatory purposes, rather than the underlying groundwater management zone objectives. If the extensive monitoring program to be conducted by the dischargers (see Salt

Management Plan – Monitoring Program Requirements, below) indicates that this strategy is not effective, then this regulatory approach will be revisited and revised accordingly.

~~Periodic review and update of the wasteload allocations is necessary to reflect changing conditions in the watershed, including increasing municipal wastewater flows, changes in water supply sources (which may affect the total dissolved solids quality of the wastewaters), and changes in the quality of the River. In part, review of the total dissolved solids wasteload allocation was initiated in response to equity concerns expressed by the dischargers. In the case of nitrogen, evidence that the nitrogen objective for the River was being exceeded prompted Regional Board staff to begin the review process [Ref. 8].~~

~~Both the TDS and nitrogen wasteload allocations were developed with the QUAL2E model, using the water supply and wastewater management plans specified in Alternative 5C. Input on rising groundwater was provided by the BPP. The ability of the individual wastewater treatment plants to meet the limits specified in the revised allocations and the facility/operational costs associated with compliance were carefully considered by both the Regional Board and the dischargers.~~

~~a.Total Dissolved Solids Wasteload Allocation~~

~~The revised wasteload allocation for TDS discharges to the Santa Ana River is shown in Table 5-4.~~

~~The 1992 baseflow TDS quality of the Santa Ana River at Prado Dam was 648mg/L, which is below the objective specified in this Basin Plan (700mg/L). The revised wasteload allocation will ensure continued compliance with the objective.~~

~~As noted in Table 5-4, footnote 1, certain discharges affect groundwater subbasins without TDS assimilative capacity (see list on page 5-14). These dischargers will be held to the affected subbasin objectives, rather than the wasteload allocations specified for them, unless the dischargers participate in acceptable salt offset programs (see section B.1. for discussion of assimilative capacity and waste discharge requirements). If approved by the Regional Board, salt offset programs can include studies to determine appropriate offset quantities (which may entail a review of subbasin water quality objectives) and project alternatives.~~

~~Where difficulties with compliance with this allocation arise, the Regional Board has determined that additional consideration should be given. As discussed earlier, the Regional Board incorporates provisions in waste discharge requirements which allow dischargers to participate in acceptable programs to offset the water quality impacts of TDS discharges in excess of specified limits. Provided that the discharger has taken all appropriate steps to minimize TDS concentrations in the wastewater, and provided that the discharger participates in a salt offset program, the Regional Board has indicated its intent not to enforce violations of the numeric TDS limits in waste discharge requirements, thereby preventing undue hardship to dischargers.~~

Table 5-4

Wasteload Allocation for Discharges of Total Dissolved Solids to the Santa Ana River and its Tributaries

DISCHARGER (NOTE#)	DISCHARGE TO	HISTORIC DATA		WASTELOAD ALLOCATION		FUTURE PROJECTIONS	
		1990 FLOW (MGD)	1990 TDS (mg/L)	1995 FLOW (11) (MGD)	1995 TDS (mg/L)	2000 FLOW (11) (MGD)	2000 TDS (mg/L)
BEAUMONT (1)	STC	0.0(9)	0	1.9	540	2.2	540
YUCAIPA VALLEY CWD (1)	STC	0.0(9)	0	3.0	540	4.0	540
REDLANDS TO PONDS (1)	R 5	6.8	465	6.0	465	5.0	515
REDLANDS TERTIARY (1)	R 5	0	0	1.6	465	3.6	515
SAN BERNARDINO	R 4	27.6	535	2.5(2)	535	4.0(2)	540
COLTON	R 4	5.1	590	0	0	0	0
SAWPA (S.B. & Colton) (1)	R 4 (3)	0	0	32.9	510	0	0
SAWPA (S.B. & Colton) (1)	R 3	0	0	0	0	37.2	550
RIALTO	R 4	6.3	530	8.0	490	13.0	400
RIVERSIDE REGIONAL	R 3	34.2	650	36.0	650	38.0	650
JURUPA CSD INDIAN HILLS	R 3	0.1	650	0.6	650	1.0	650
CHINO BASIN MWD RP3	R 3	0	0	0	0	8.0	650
WESTERN RIVERSIDE	R 3	0	0	7.0	625	10.0	625
CORONA TERTIARY	TMS	0	0	1.0	700	5.0	650
CORONA TO PONDS	R 3	7.4	700	10.0	700	10.0	650
LEE LAKE WD	TMS	0.3	650	1.3	650	2.0	675
ELSINORE VALLEY MWD	TMS	2.0	700	7.0	700	9.0	675
EASTERN MWD (4)	TMS	0.0(10)	0	16.0	650	28.0	650
CHINO BASIN MWD RP2A (5)	CHN	0	0	7.7	555	10.4	560
CHINO BASIN MWD RP2	CHN	6.6	610	6.3	610	7.0	600
CHINO BASIN MWD RP1	CHN (6)	17.8	515	24.2	515	16.7	540
CHINO BASIN MWD RP1	CUC (7)	19.8	515	21.4	515	18.1	540
CHINO BASIN MWD RP4	CUC (8)	0	0	0	0	13.4	505
TOTAL		**134.2**		**194.4**		**245.6**	

NOTES

STC - SAN TIMOTEO CREEK R 5 - REACH 5 SANTA ANA RIVER R 4 - REACH 4 SANTA ANA RIVER R 3 - REACH 3 SANTA ANA RIVER

TMS - TEMESCAL CREEK CHN - CHINO CREEK CUC - CUCAMONGA (Mill) CREEK

(1) These discharges affect subbasins that do not have assimilative capacity for TDS. TDS wasteload allocations apply to these discharges in lieu of direct application of groundwater objectives, only if these dischargers participate in approved mitigation (offset) programs (see discussion re: Rancho Caballero decision on p. 5-15)

(2) Local reclamation. **(3)** At RIX site, (lower part of Colton Subbasin). **(4)** San Jacinto River Basin. **(5)** Carbon Canyon Plant. **(6)** Prado Park Lake.

(7) Near HWY 60 Xing. **(8)** Via Deer Creek. **(9)** Flows from Beaumont and Yucaipa are shown as zero since they are not always continuous with the river.

(10) EMWD's present discharges are reclaimed or percolated. **(11)** Flow estimates used for model projections, TDS limits apply to all flows up to and including estimated values.

Table 5-5

Alternative Wasteload Allocations through 2010
based on "Maximum Benefit" or "Antidegradation" Water Quality[1]

Publicly Owned Treatment Works (POTW)	**Alternative 2010A – Reclamation in 1995 Basin Plan**			**Alternative 2010B – Reclamation Plans Advocated by POTWs/others**		
	Surface Water Discharge (MGD)	**TDS (mg/L)**	**TIN (mg/L)**	**Surface Water Discharge (MGD)**	**TDS (mg/L)**	**TIN (mg/L)**
Beaumont – "max benefit" [2]	2.3	490	6.0	1.0	490	6.0
Beaumont – "antideg" [2, 3]	2.3	320[3]	4.1[3]	1.0	320[3]	4.1[3]
YVWD – Wochholz – "max benefit"	5.7	540	6.0	0.0	540	6.0
YVWD – Wochholz – "antideg" [3]	5.7	320[3]	4.1[3]	0.0	320[3]	4.1[3]
Rialto	12.0	490	10.0	10.0	490	10.0
RIX	49.4	550	10.0	28.2	550	10.0
Riverside Regional WQCP	35.0	650	13.0	26.1	650	13.0
Western Riverside Co. WWTP	4.4	625	10.0	3.3	625	10.0
EMWD[4]	43	650	10.0	6.0	650	10.0
EVMWD – Lake Elsinore Regional	7.2	700	13.0	2.0	700	13.0
Lee Lake WRF	1.6	650	13.0	1.6	650	13.0
Corona WWTP # 1	3.6	700	10.0	2.0	700	10.0
Corona WWTP # 2	0.2	700	10.0	0.5	700	10.0
Corona WWTP # 3	2.0	700	10.0	0.5	700	10.0
IEUA Facilities [5]	80.0	550	8.0	37.4	550	8.0

1. "Antidegradation" wasteload allocation is the default allocation if the Regional Board determines that "maximum benefit" commitments are not being met.
2. Beaumont discharges to Coopers Creek, a tributary of San Timoteo Creek, Reach 4, it is a *de facto* discharge to San Timoteo Creek/San Timoteo Management Zone.
3. "Antidegradation" wasteload allocations for City of Beaumont and YVWD based on additional model analysis performed by WEI (WEI, October 2002).
4. EMWD discharges are expected to occur only during periods of wet weather.
5. IEUA facilities include the RP#1, Carbon Canyon WRP, RP#4 and RP#5; These facilities are to be regulated as a bubble (see text).

~~a.Nitrogen Wasteload Allocation~~

~~Because so much of the water in the Santa Ana River is made up of treated municipal effluent (particularly during low flow periods), there is the threat of significant nitrogen discharge impacts on the groundwaters of both the upper Santa Ana Basin and Orange County, and on the aquatic fauna of the River itself. The latter impact is related to discharges of ammonia, one of the components of nitrogen which dissociates under certain conditions to the toxic un-ionized form.~~

~~To address these concerns, a total inorganic nitrogen wasteload allocation, including specific limits on nitrate and ammonia, was included in the 1983 Basin Plan. However, as previously noted, evidence that the nitrogen objective for the River was being violated indicated that review and revision of that wasteload allocation was necessary. That review was conducted as part of the comprehensive TDS and Nitrogen Management Studies for the upper Santa Watershed [Ref. 1-4]. In addition, a revised objective for un-ionized ammonia is specified in this Plan, necessitating revision of ammonia effluent limits.~~

~~1)Total Inorganic Nitrogen~~

~~In 1991, the Regional Board adopted a revised total inorganic nitrogen (TIN) wasteload allocation (Resolution No. 91-125). After extensive analysis of alternatives and discussions with dischargers, the TIN allocation selected was the one specified in Alternative 5C-10, a part of the Recommended Plan in this Basin Plan. Under Alternative 5C-10, wastewater discharges to Reaches 4 and 5 of the River and tributaries thereto are limited to 10mg/L TIN; for discharges to Reach 3, existing[3] POTW flows are limited to 13mg/L TIN, while new[4] flows are limited to 10mg/L. The Recommended Plan also specifies that all wastewater discharges to percolation ponds (existing and new) be limited to 10mg/L TIN.~~

~~In contrast to its predecessor in the 1983 Basin Plan, this revised allocation addresses compliance with nitrogen objectives throughout the River system and not only at Prado Dam. In addition, the revised total inorganic nitrogen allocation addresses the severe groundwater nitrate problems identified in the comprehensive TDS and nitrogen management studies for the upper Santa Ana Watershed. The total nitrogen objectives for the various reaches of the River were established to protect the use of the River for groundwater recharge (**GWR**) and, by extension, the quality of underlying groundwater. As shown on page 5-14, many of the groundwater subbasins in the upper Santa Ana Basin, including those affected by Santa Ana River flows, exceed their respective nitrate objectives. This requires that the Regional Board impose limits on wastewater discharges which are sufficient to ensure compliance with water quality objectives throughout the River system. The historic focus on objective compliance at Prado is no longer adequate. This is reflected in the TIN limits specified in the wasteload allocation. In addition, the revised total inorganic nitrogen wasteload allocation addresses the ground water nitrate problem by specifying the wastewater discharges to percolation ponds not exceed 10mg/L TIN. The groundwater subbasins of the upper Santa Ana Basin are designated for use for municipal and domestic supply (**MUN**). The 10mg/L TIN concentration is essentially comparable to the nitrate drinking water standard which protects the **MUN** use. By holding wastewater discharges to percolation ponds to 10mg/L TIN, the Regional Board ensures that **MUN** use will not be adversely affected by those discharges, and that~~

[3] ~~For the purposes of this allocation "existing" POTW flows are defined as the wastewater flows projected in the model up to the year 2000. Projected wastewater flows are shown in Table 5-5~~

[4] ~~For the purpose of this allocation, "new" flows are defined as flows from new treatment facilities projected to come on-line during the planning period (1990-2000) (*e.g.,* Chino Basin MWD RP2A and RP4), flows from existing wastewater treatment plants not previously discharged to the Santa Ana River system (*e.g.,* Eastern Municipal Water District), and any flows from operating POTWs which are in excess of existing flows, as defined (see footnote 3).~~

~~cleanup of currently unusable groundwater will not be encumbered by percolation of wastewater with nitrogen in excess of potable standards.~~

~~The wasteload allocation is shown in Table 5-5. The salient features of this table are:~~

- ~~Present and projected wastewater discharges to the middle Santa Ana River and its tributaries are listed in the left column. The total inorganic nitrogen wasteload allocation to be used to establish effluent limitations for these discharges is the set of total inorganic nitrogen concentrations shown for the year 1995 discharges.~~
- ~~The Cities of Redlands and Corona currently discharge to percolation ponds. Corona's discharge is considered as a direct discharge to the Santa Ana River. In the future, portions of the flow from both communities will receive tertiary treatment with discharge to the Santa Ana River.~~
- ~~Year 1990 and projected years (1995 and 200) wastewater flows for each of the discharges are listed. Year 1990 wastewater flows (and total inorganic nitrogen concentrations) are shown for information only. The years 1995 and 2000 flow values are not intended as limits on POTW flows. Rather, these flows were derived from population assumptions and are used in the models for quality projections. Wastewater flows significantly in excess of those projected will necessitate additional model analysis to confirm the propriety of the allocation.~~
- ~~Year 2000 wastewater flows and total inorganic nitrogen concentrations are listed in Table 5-5. These values may be revised.~~

~~2)~~Ammonia

Total inorganic nitrogen is used for regulatory purposes in wasteload allocations and surface water discharge limits. It is the sum of nitrate, nitrite and ammonia. Ammonia dissociates under certain conditions to the toxic un-ionized form. Thus, nitrogen discharges to the Santa Ana River and other surface waters pose a threat to aquatic life and instream beneficial uses, as well as to the beneficial uses of affected groundwater.

~~The u~~Un-ionized ammonia objectives are specified in Chapter 4 of this Basin Plan for warmwater aquatic habitats, such as the Santa Ana River system. Table 5-6 specifies the ammonia limits necessary to achieve these objectives. These limits were derived using QUAL2E, the Colorado Ammonia Model, water quality data on the River and effluent quality.

The un-ionized ammonia objectives have not been approved by the United State Environmental Protection Agency (USEPA), which recommends that the objectives be reviewed and revised based on the Agency's revised national ammonia criteria. A review of the un-ionized ammonia objectives is included in the Regional Board's 2002 Triennial Review Priority List. Any revised objectives and revised ammonia effluent limits needed to achieve the revised objectives will be incorporated in future amendments to this Plan once the requisite review is completed.~~, is more stringent than that found in the 1983 Basin Plan. The ammonia limits in the 1983 wasteload allocation will not ensure compliance with the new objective.~~

~~Revised ammonia effluent limits for discharges to the Santa Ana River system are incorporated in this Plan (Table 5-6). The revised limits were derived using QUAL2E, the Colorado Ammonia Model, water quality data on the River and effluent quality.~~

Table 5-6

Effluent Limits for Total Ammonia Nitrogen[1]

Discharge Location	Effluent Limit - Total Ammonia Nitrogen[2] (mg/L)	
	Year 1995	Year 2000
San Timoteo Wash	5.0	4.5
Santa Ana River - Reach 4	5.0	4.5
Santa Ana River - Reach 3	5.0	5.0
Chino Creek	5.0	4.5
Mill Creek (Prado Area)	5.0	4.5
Temescal Creek	5.0	4.5
Other **WARM** designated waterbodies	Determined on a case-by-case basis	

1 Total Ammonia Nitrogen Wasteload Allocation is specified in order to meet the site-specific Santa Ana River un-ionized ammonia objective (See Chapter 4).

2 Total Ammonia Nitrogen = Un-ionized Ammonia Nitrogen (NH_3-N) + Ammonium Nitrogen (NH_4^+-N).

Table 5-5

Wasteload Allocation for Discharges of Total Inorganic Nitrogen (TIN) to the Santa Ana River and its Tributaries

DISCHARGER (NOTE #)	DISCHARGE TO	HISTORIC DATA		WASTELOAD ALLOCATION		FUTURE PROJECTION	
		1990 FLOW (MGD)	1990 TIN (mg/L)	1995 FLOW (10) (MGD)	1995 TIN (mg/L)	2000 FLOW (10) (MGD)	2000 TIN (mg/L)
BEAUMONT	STC	0 (8)	0	2.0	10	2.2	10
YUCAIPA VALLEY CWD	STC	0	0	5.5	10	6.0	10
REDLANDS TO PONDS (1)	R-5	6.8	23	5.1	10	5.1	10
REDLANDS TERTIARY	R-5	0	0	2.7	10	3.6	10
SAN BERNARDINO	EWC	27.6	22	17.7	10	17.7	10
COLTON	R-4	5.1	16	0	0	0	0
SAN BERNARDINO TERTIARY (2)	R-3	0	0	15.7	13	17.7	13
COLTON TERTIARY (2)	R-3	0	0	6.0	13	6.8	13
RIALTO TERTIARY	R-4	6.3	20	8.8	10	11.6	10
RIVERSIDE REGIONAL	R-3	34.2	16	35.9	13	38.0	13
JURUPA CSD INDIAN HILLS	R-3	0.1	10	0.7	10	0.7	10
CHINO BASIN MWD RP3	R-3	0	0	8.0	10	11.8	10
WESTERN RIVERSIDE REGIONAL	R-3	0	0	6.8	10	8.4	10
CORONA TERTIARY	TMS	0	0	1.0	10	4.6	10
CORONA TO PONDS (1)	R-3	7.4	18	10.2	13	9.0	13
LEE LAKE WD	TMS	0.3	10	1.3	13	1.7	13
ELSINORE VALLEY MWD	TMS	2.0	10	7.2	13	8.8	13
EASTERN MWD (3)	TMS	0 (9)	0	16.6	10	27.9	10
CHINO BASIN MWD RP2A (4)	CHN	0	0	6.4	10	9.6	10
CHINO BASIN MWD RP2	CHN	6.6	17	6.8	13	6.7	13
CHINO BASIN MWD RP1 (5)	CHN	17.8	19	17.5	13	17.0	13
CHINO BASIN MWD RP1 (6)	CUC	19.8	19	17.5	13	17.4	13
CHINO BASIN MWD RP4 (7)	CUC	0	0	3.1	10	6.3	10
TOTAL		134.2		202.2		238.3	

NOTES

Total inorganic nitrogen (TIN) is the sum of the nitrate-N, nitrite-N, and ammonia-N in a filtered sample of water.

STC - SAN TIMOTEO CREEK
R-5 - REACH 5 SANTA ANA RIVER
EWC - EAST WARM CREEK
R-3 - REACH 3 SANTA ANA RIVER
R-4 - REACH 4 SANTA ANA RIVER
TMS - TEMESCAL CREEK
CHN - CHINO CREEK
CUC - CUCAMONGA (MILL) CREEK

(1) Indirect load
(2) Diverted to R-3
(3) San Jacinto River Basin
(4) Carbon Canyon Plant
(5) Near Hwy 60 Xing
(6) Prado Park Lake
(7) Via Deer Creek

(8) Flows from Beaumont and Yucaipa are shown as zero since they are not always continuous with the River. Actual 1990 discharges: Beaumont 1.0 MGD; Yucaipa 2.5 MGD.
(9) EMWD's present discharges are reclaimed or percolated. A surface discharge may be made in the future.
(10) Flow estimates used for model projections. TIN limits apply to all flows up to and including estimated values.

~~4.~~5. Wastewater Reclamation

Reclamation of wastewater for reuse (recycled water) is an important feature of ~~the W~~wastewater ~~Management Plan~~ and water management for the ~~upper~~ Santa Ana ~~Basin~~ Region. ~~and, indeed, for the Region as a whole.~~ The California Legislature has declared the primary interest of the people of California in the development of facilities to recycle wastewater to supplement existing water supplies and to meet future water demands (Water Code Section 13510-13512). State policy (State Board Resolution No. 77-1) affirms this commitment to encourage recycled water use. ~~strongly supports reclamation.~~ However, because reclamation projects tend to add to the salt balance problem in the Region, they must be carefully planned and implemented. The significant benefits~~, which~~ that result from such projects, include:

- The total water supply can be effectively increased, reducing the need for imports;
- Wastewater treatment costs can be reduced in some cases. Meeting the level of treatment required for discharge to surface waters may be more expensive than treating the effluent for use in irrigation;
- Stream flows can be established or enhanced, providing aquatic riparian habitat and allowing recreation and other beneficial uses of the stream;
- Downstream delivery commitments can often be met by discharges of appropriately treated wastewater.

Concerns related to wastewater reclamation projects include:

1. Mineral Quality Effects

The mineral quality of the receiving water (surface or groundwater) can be adversely affected. Each cycle of water use increases the salinity of the water. The amount of the increase depends on the type of use; normal domestic use generally adds 200-300mg/L of TDS to the initial concentration. Agricultural use generally doubles the salinity, while industrial uses most often degrade water quality to a level where it may be unsuitable for discharge. Therefore, it is important that the type of reclaimed wastewater use and the likely effects on water quality be evaluated carefully prior to initiating such reuse. Certain waters in the upper Santa Ana Basin do not have assimilative capacity to accept the additional salinity ~~which~~ that would be expected to ~~probably~~ result from reclamation.

2. Public Health Effects

Municipal wastewaters contain significant concentrations of bacteria, viruses, and organics. These wastewaters must be treated extensively to remove pathogens before they can be reclaimed. Stable organics in reclaimed water are also cause for considerable concern. Chlorination of treated wastewater effluents can produce chlorinated hydrocarbons, some of which are carcinogenic. For this reason, the California State Department of Health Services is concerned with proposals ~~which~~ that would return a high proportion of treated wastewater effluent into domestic water supply aquifers. Adequate treatment and dilution of the wastewater is essential. The Department is developing guidelines for the purposed use of reclaimed wastewater for groundwater recharge.

Because of the high percentage of wastewater in river baseflow, the Santa Ana River Water Quality and Health (SARWQH) Study was initiated by OCWD in 1994 to evaluate the use of the Santa Ana River to recharge the Orange County groundwater basin. The goal of the SARWQH

Study was to characterize the quality of the Santa Ana River water and the quality of the groundwater basin it recharges. The study included an examination of hydrogeology, microbiology, water chemistry, toxicology and public health. The results of the study indicate that current recharge practices using Santa Ana River water are protective of public health.

3. Land Use Considerations

One of the major problems facing the future of wastewater reclamation is a decrease in the total amount of agricultural land in the basin. As the population of the basin increases, commercial and residential developments eliminate agricultural land and the need for irrigation waters. Some reclaimed wastewater may be used for irrigating landscaping in the new developments, but the volume utilized will almost certainly be reduced.

4. The Prado Settlement

On October 18, 1963, the Orange County Water District filed a class action lawsuit against the water users in the upper Santa Ana Basin, seeking an adjudication of water rights against substantially all the water users in the area tributary to Prado Dam in the Santa Ana River watershed. As a result of the 1969 settlement of this case, the wastewater dischargers in the upper basin are required to provide 42,000 acre-feet at Prado Dam. This can consist of treated wastewater effluent or imported water as well as certain natural flows (*e.g.,* rising water); stormflows are not included. The amount of flow delivered is subject to adjustment based upon the TDS content of the water. Reclamation uses within the upper basin are thus limited to a degree by the need to ensure compliance with this settlement.

Wastewater is presently being reclaimed in the ~~upper~~ Santa Ana ~~Basin~~ Watershed ~~(and elsewhere in the Region)~~ in a number of different ways:

1. Irrigation of Agricultural Land and Landscaping

Most of the direct reclamation of wastewater in the Region occurs as part of commercial agricultural and landscape irrigation, although this will change as recharge projects using recycled water are implemented (see below). This use is conducted under ~~W~~water ~~R~~reclamation ~~R~~requirements issued by the Regional Board, typically as part of Waste Discharge Requirements and NPDES permits. In the San Jacinto Watershed, most of the wastewater is reclaimed for agricultural uses.

2. Discharge to the Santa Ana River

Although it is not widely considered as such, discharges of treated wastewater to Reaches 3, 4 and 5 of the Santa Ana River constitute the largest single reclamation activity in the Region. These discharges make up as much as 95 percent of the river's dry weather flow and enhance the in-stream beneficial uses of the river throughout its 26-mile length (San Bernardino to Prado Dam). Essentially all of this water is recharged into the groundwater basin in Orange County~~.~~

3. Groundwater Recharge by Percolation

This type of reclamation is common throughout the Region. Most wastewater treatment plants ~~which~~ that do not discharge directly to the River discharge their effluent to percolation ponds. All of the treated wastewater in the upper Santa Ana Basin ~~which~~ that is not directly reclaimed for commercial agricultural and landscape irrigation purposes, or discharged directly to the Santa Ana River, is returned to local or downstream groundwater ~~subbasins~~ management zones by percolation. In Orange County, reclaimed water is used for greenbelt and landscape irrigation, and injected into coastal aquifers to control sea water intrusion.

Significant additional reclamation activities are planned in the Region, as reflected in Table 5-7. The Chino Basin Watermaster, Inland Empire Utilities Agency, Yucaipa Valley Water District, the City of Beaumont and the San Timoteo Watershed Management Authority propose to implement extensive groundwater recharge projects using recycled water. To accommodate these projects and other water and wastewater management strategies, these agencies have made the requisite demonstrations necessary to support the "maximum benefit" TDS and nitrate-nitrogen water quality objectives specified in this Plan for certain groundwater management zones (see Chapter 4). The recharge projects will provide reliable sources of additional water supply needed to support expected development within the agencies' areas of jurisdiction. These agencies' "maximum benefit" programs are described in detail in Section VI. of this Chapter.

In Orange County, significant reclamation activities include the implementation of the Groundwater Replenishment System, a joint effort of the Orange County Water District and Orange County Sanitation District. Treated wastewater provided by the Sanitation District will receive extensive advanced treatment, including microfiltration, reverse osmosis, and disinfection using ultraviolet light and hydrogen peroxide. In the first phase of the project, approximately 70, 000 acre-feet per year of highly treated recycled water will be produced and distributed to groundwater recharge facilities and to injection wells used to maintain a seawater intrusion barrier. The System will enhance both the quality and quantity of groundwater resources, the major source of water supply in the area. It will reduce the need for imported water and prevent, or at least delay, the need for an additional ocean outfall for disposal of the wastewater treated by the Sanitation District. Implementation of the GWR System will be phased. Operation of Phase 1 will begin in 2007. Future phases to expand the capacity of the GWR System are possible.

4. Dual Water Supply Systems

Given increasing demands for water supply but diminishing resources, there is great interest in using reclaimed water in office buildings and the like for flushing toilets and urinals. Clearly, the addition of this water supply source must be carefully planned and overseen to prevent ~~any~~ public health problems. No dual systems have been implemented as yet in the upper basin; in Orange County, the Irvine Ranch Water District has implemented dual systems (a reclaimed water system in addition to a potable supply) in a number of office buildings in its service area, with the approval of the Department of Health Services and the Regional Board.

~~As discussed in a later section regarding TDS and nitrogen management activities in the lower Santa Ana Basin, wastewater is also reclaimed and used to control saltwater intrusion into the coastal aquifers of the Region.~~

The ~~Recommended~~ Salt Management Plan draws a balance between the benefits and problems of reclamation by including carefully planned ~~and limited~~ reclamation activities in the ~~upper basin~~watershed. The Recommended Plan provides for reclamation within the upper basin, as shown in Table 5-7. All recycled water recharge projects will be regulated pursuant to the process identified in the discussion regarding assimilative capacity, and in accordance with the "maximum benefit" implementation strategies identified later in this Chapter (see section VI., Maximum Benefit Implementation Plans for Salt Management). ~~Discharges associated with large scale reclamation projects which are not identified in the recommended plan and which have the potential to significantly~~

~~affect the surface or groundwater quality must be subjected to further analysis prior to their implementation to evaluate the water quality impacts.~~

Recycled water used for landscape irrigation deserves special regulatory consideration. As discussed in the section on nitrogen loss coefficients, the Regional Board does not regulate nitrogen in recycled water used for landscape irrigation, recognizing the nitrogen losses that will occur as the result of plant uptake. The Nitrogen /TDS Task Force sponsored update of the TDS/Nitrogen Management Plan demonstrated that it is appropriate also to apply a 25 percent nitrogen loss coefficient to recycled water discharges applied to land to account for subsurface transformation and loss. Nitrogen losses due to plant uptake and subsurface transformation justify the Board's regulatory approach. With respect to TDS, the water quality effects of recycled water used for landscape irrigation will be evaluated on a case-by-case basis and regulated accordingly.

6. Special Considerations – Subsurface Disposal Systems

In addition to establishing prohibitions and minimum lot size requirements for the use of subsurface disposal systems for sanitary wastes, the Regional Board issues waste discharge requirements where necessary to assure the protection of water quality and public health. In most cases, these requirements have been issued for commercial and industrial facilities, including mobile home parks, RV parks and truck washing operations, where the volume of waste is high and/or there is the potential for the discharge of wastes other than domestic sewage. Waste discharge requirements for individual residential systems and low volume (less than 500 gallons per day) domestic waste discharges from industrial and commercial facilities have been largely waived, pursuant to the waiver provisions of the Water Code (see discussion of waivers in the "Implementation through Waste Discharge Requirements" section, above). These waivers are conditional and may be revoked by the Regional Board at any time.

The Board has included TDS limitations in these waste discharge requirements in order to assure that the discharges are consistent with the TDS objectives of the affected receiving waters. These limits are expressed as both a maximum value that is based on the TDS objective of the receiving water, and a value that allows a reasonable use increment of 250 mg/L TDS above water supply quality. The more restrictive of the two TDS limits controls the allowed quality of the discharges.

TDS and nitrogen contributions from domestic waste discharges to existing commercial, industrial and residential subsurface disposal systems are reflected in the determinations of current ambient ground water quality and assimilative capacity (see preceding section – B.1.) on assimilative capacity). These determinations were made as part of the N/TDS Task Force sponsored update of the TDS/nitrogen management plan in this Basin Plan. These contributions are expected to decline over time as these discharges are eliminated through the expansion of regional sewer systems.

Compliance with TDS limits by these facilities is particularly problematic, since these facilities typically have little or no control over the TDS quality of water supplied to them, unlike POTWs. Further, sewering of the discharges is often not an option, at least at the present time, although this is changing as rapid new development in many parts of the region continues to drive the expansion of sewer facilities. As systems expand, many of these discharges will be eliminated as they are connected to the sewers. Finally, the offset provisions that are applied to POTWs are unnecessary for existing residential commercial and industrial domestic waste discharges, given that they are addressed as part of the Regional Board's minimum lot size program for subsurface disposal systems and through the updated TDS and nitrogen management plan in this Basin Plan as part of the overlying land-use considerations and ambient water quality determinations.

Taking these factors into consideration, the waste discharge requirements that have been issued and will be updated periodically for domestic waste discharges from these existing residential, commercial and industrial facilities will include TDS requirements that specify a maximum mineral increment of 250 mg/L TDS to the water supply quality. This will assure reasonable use and prevent the disposal of highly saline wastes. Existing facilities are defined as those for which waste discharge requirements have been issued, or that have been built as of [*the effective date of this Basin Plan amendment*].

Table 5-7

Wastewater Reclamation ~~as Specified in Alternative 5C Upper Santa Ana Basin~~

Subbasin (Management Zone) Receiving Reclaimed Water	Source	Amount AF/Y ~~Period 1995 - 2000~~2010-A[1]	Amount AF/Y 2010-B[2]
~~San Timoteo~~Beaumont MZ	Beaumont, City of	250	1,500
Yucaipa MZ	Yucaipa Valley Water District	--	6,400
~~Bunker Hill II~~Bunker Hill B MZ	San Bernardino, City of and Colton, City of	117	26,200
Colton MZ	~~Colton~~Rialto, City of	200	
~~Chino II and III~~Chino North MZ	IEUA~~Chino Basin MWD~~ RP-1	1,200	48,000
~~Chino II and III~~Chino North MZ	IEUA~~Chino Basin MWD~~ RP-2A	2,470	
~~Chino II and III~~Chino North MZ	IEUA~~Chino Basin MWD~~ RP-4	3,300	
~~Chino III~~Chino North MZ	California Institute for Men	650	650
~~Chino I~~Chino North MZ	Upland Golf Course	31	31
Temescal MZ	Corona, City of	1,000	3,100
	TOTAL	**9,218**	**86,000**

[1] wastewater reclamation assumed in 2010-A is the same as that assumed in the 1995 Basin Plan when approved in 1994/1995 (also known as Table 5-7)

[2] wastewater reclamation assumed in 2010-B as identified by POTWs (see Ref. 3, 5).

~~C.~~V. ~~Groundwater Management Plan~~Other Projects and Programs

In addition to the regulatory efforts of the Regional Board described in the preceding section, water and wastewater purveyors and other parties in the watershed have implemented, and propose to implement, facilities and programs designed to address salt problems in the groundwater of the Region. These include the construction of brine lines and groundwater desalters, implementation of programs to enhance the recharge of high quality stormwater and imported water, where available, and re-injection of recycled water to maintain salt water intrusion barriers in coastal areas. These projects and programs are motivated by the need to protect and augment water supplies, as well as to facilitate compliance with waste discharge requirements.

A. Brine lines

There are two brine line systems in the Region, the Santa Ana Regional Interceptor (SARI) and the older Chino Basin Non-Reclaimable Line (NRL). These lines are used to transport brine wastes out of the basin for treatment and disposal to the ocean. They are a significant part of industrial waste management and essential for operation of desalters in the upper watersheds. The SARI Line was constructed and is owned by SAWPA. It is approximately 93 miles of 16 inch to 84 inch pipeline connected to the Orange County Sanitation District treatment facilities. SAWPA owns capacity rights in SARI downstream of Prado Dam. The line extends from the Orange County Line near Prado Dam northeast to the San Bernardino area. Recently, the SARI Line has been extended to serve the San Jacinto Watershed. SARI Reach 5 extends up the Temescal Canyon from the City of Corona to the Eastern Municipal Water District (EMWD) brine line terminus in the Lake Elsinore area. EMWD's Menifee Desalter and other high salinity discharges from EMWD and Western Municipal Water District now have access to the brine line.

The Chino Basin Non-Reclaimable Line (NRL) is connected to the Los Angeles County Sanitation District sewer system in the Pomona area. The NRL, which is owned and operated by Inland Empire Utilities Agency, exports non-reclaimable industrial wastes and brine from the Chino Basin. It extends eastward from the Los Angeles County Line to the City of Fontana. It was originally built to serve industries including the Kaiser Steel Company and Southern California Edison Power Plants.

B. Groundwater desalters

The studies leading to the development of the TDS/Nitrogen management plan included in this Basin Plan when it was approved in 1995 demonstrated that it was not realistic to achieve compliance with all the nitrogen and TDS objectives for the groundwater subbasins then identified within the Region. Long-term historic land use practices, particularly agriculture, have left an enormous legacy of salts that are now in the unsaturated soils overlying the groundwater subbasins (now, newly defined groundwater management zones). A significant amount of these salts will, over time, degrade groundwater quality. The programs of groundwater extraction, treatment, and replenishment needed to completely address these historic salt loads were shown to far exceed the resources available to implement them.

While the boundaries of the groundwater management zones have been revised and new TDS and nitrate-nitrogen water quality objectives established, the salt legacy problem remains. The construction and operation of groundwater desalters to extract and treat poor quality groundwater continues to be an essential component of salt management in the Region. Such projects will be increasingly important to protect local water supplies and to provide supplemental, reliable sources of potable supplies.

~~The Groundwater Management Plan attempts to balance natural recharge, artificial recharge, groundwater pumping, surface water use, imported water use, and wastewater reclamation in order to optimize water quality and quantity. In essence, it is an integration of the Water Supply Plan and the Wastewater Management Plan. In addition, where necessary, the Groundwater Management Plan includes specific remediation programs and projects, such as groundwater extraction and treatment. The Basin Planning Procedure (BPP) is used to balance these various Plan components.~~

~~One of the most important aspects of groundwater management planning in the basin has been the ongoing effort (since 1971 Interim Plan) to move once used water downstream rather than recycling it back to the local groundwater basins. Careful management of reuse and reclamation within any one subbasin reduces the problem of excessive mineralization. This approach does not require more imported water if the needs of both the upper and lower basin are considered. In this Recommended Plan, most municipal wastewater is exported directly from the upper basin, reducing groundwater quality degradation and localized high groundwater problems. This Plan also includes adequate recharge of groundwater basins with food quality water.~~

~~The Recommended Plan includes five specific groundwater extraction and treatment projects (desalters), as shown in Table 5-8. The Arlington Desalter is already in operation; the Recommended Plan assumes that the remaining facilities will be in place by 1995. Two chino desalters are in advanced planning stages.~~ A number of groundwater desalters have already been constructed, and more are planned. These facilities are described below.

1. Upper Santa Ana Basin

In the Upper Santa Ana Basin, the Santa Ana Watershed Project Authority constructed and operates the Arlington desalter. This desalter, with a capacity of about 7 MGD, treats water extracted from the Arlington Management Zone, which was heavily impacted by historic agricultural activities.

In the Chino Basin, the Chino Desalter Authority operates the Chino 1 desalter, which is planned for expansion from 8 MGD to 13 MGD capacity. Additional desalters and desalter capacity will be constructed as part of a "maximum benefit" proposal by the Chino Basin Watermaster and the Inland Empire Utilities Agency (see section VI., Maximum Benefit Implementation Plans for Salt Management).

The City of Corona began operation of the Temescal desalter in late 2001. The desalter has a capacity of 10 MGD. The City is currently expanding the desalter by 5 MGD. It is expected to be operational in the early 2004. The product water is used to supplement current municipal supplies. The improved TDS quality of these supplies is an important part of the City's efforts to assure compliance with waste discharge requirements.

In the San Timoteo Watershed areas, desalters will be implemented as necessary for the Yucaipa and Beaumont areas, as discussed in detail in Section VI., Maximum Benefit San Timoteo Watershed Salt Management Plan.

2. San Jacinto Watershed

EMWD operates the Menifee desalter, which has a capacity of about 3 MGD. Product water is added to the EMWD municipal supply system, and the waste brine is discharged to a non-reclaimable waste disposal system that is ultimately connected to the SAWPA SARI system. The desalter extracts groundwater from the Perris South and Menifee Management Zones, both of which are adversely affected by historic salt loads contributed largely by agricultural activities.

EMWD plans to construct a desalter with capacity of about 4.5 MGD to treat poor quality water extracted from the Perris South and Lakeview/Hemet North Management Zones. The purpose of this facility is to stop subsurface migration of poor quality groundwater from the Perris South Management Zone into the Lakeview/Hemet North Management Zone.

~~Table 5-8~~

~~Recommended Plan - Groundwater Extraction and Desalting Facilities[1]~~
~~Upper Santa Ana Basin~~

~~Groundwater Desalter~~	~~Approximate Poor Quality Extraction Amount (AF/Y)~~	~~Product Water Flow (MGD)~~	**~~Community Served~~**
~~Arlington[2]~~	~~7,800~~	~~6.3~~	~~Orange County Groundwater~~
~~Southwest Chino[3]~~	~~16,000~~	~~10.7~~	~~City of Chino;~~ ~~San Bernardino County Water Works No. 8~~
~~Southeast Chino[3]~~	~~30,000~~	~~24.2~~	~~Jurupa CSD;~~ ~~City of Norco~~
~~Riverside/Colton~~	~~28,000~~	~~18.9~~	~~City of Riverside~~
~~Temescal~~	~~25,000~~	~~19.5~~	~~City of Corona~~
~~TOTAL~~	**~~106,800~~**	**~~80.0~~**	~~---~~

~~[1] Recommended Plan (Alternative 5C), Year 2000.~~
~~[2] The Arlington Desalter is currently in operation.~~
~~[3] Phase II figures for the Chino Basin Desalters. At the completion of Phase I, the desalters will extract approximately 7,000 AF/Y each and produce a total of approximately 10.7 MGD of product water.~~

~~1.Arlington Desalter~~

~~The water quality of the Arlington Subbasin has been degraded by historic agricultural activities. Agricultural drainage has increased salt level in the groundwater to the point that the water is no longer a viable drinking water source.~~

~~To reclaim the use of this subbasin, the Santa Ana Watershed Project Authority (SAWPA), in cooperation with the Metropolitan Water District of Southern California and the State Water Resources Control Board, constructed the Arlington desalter. This facility is now in operation. At full production, this desalter produces 6 million gallons per day of potable water [Ref. 9].~~

~~The operation of the desalter will reduce the amount of salts entering the Santa Ana River, provide a potable water supply, and help to restore the quality of the groundwater subbasin. The BPP results show that this subbasin has assimilative capacity for both TDS and nitrate, apparently made available by the operation of this facility.~~

~~2.Chino Basin Desalter Projects~~

~~Two Chino Basin desalters are now being planned by SAWPA and other local and regional agencies. In the first phase, these facilities will extract and treat approximately 14,000 acre-feet per year of brackish groundwater from the Chino III Subbasin. The objectives of the desalters are to protect and create potable water supplies and to intercept poor quality rising groundwater and improve the quality of the Santa Ana River baseflow. When operational, these facilities will~~

~~remove about 15,000 tons of salts from the Basin annually. It is expected that these facilities will be expanded in the future.~~

~~3. Riverside/Colton Desalter~~

~~The Recommended Plan includes a desalter to address the severe TDS and nitrate problems in the Colton and Riverside Subbasins, caused largely by historic agriculture and long-term recharge of these subbasins by wastewater effluents. As proposed in the Recommended Plan, this desalter would improve the quality of the waters in the subbasin and the quality of both the drinking water supplies and wastewaters of the City of Riverside and the Rubidoux Community Service District.~~

~~An intensive study of water sources management for the Colton and Riverside Subbasins in now underway (see Chapter 7). This study may result in additional or alternative recommendations or water quality management in this area. Revisions to this Recommended Plan can be considered on the basis of the results and recommendations of this study.~~

~~4.Temescal Desalter~~

~~The Recommended Plan also includes a desalter for the Temescal Subbasin. This desalter would: improve the drinking water and wastewater quality for the City of Corona; reduce that City's reliance on Colorado River water as a source of supply (Colorado River Water is high in TDS content); and finally, improve the quality of the subbasin.~~

~~5.Special Studies~~

~~A number of studies are in progress to investigate in greater detail the TDS and nitrogen problems in the Upper Santa Ana Basin and to identify solutions. The results of these studies may lead to changes in this Basin Plan, including new regulatory strategies or other implementation measures.~~

~~These efforts include the development and evaluation of water resources management plans for the Chino Basin (Chino Basin Water Resources Management Study) and for the Colton-Riverside Subbasins (Colton-Riverside Basin Conjunctive Use Study). Studies are also in progress to evaluate total inorganic nitrogen and total organic carbon removal in the Prado Basin (Santa Ana River TIN/TOC Study). A brief description of each of these programs is included in Chapter 7.~~

~~SALT BALANCE AND ASSIMILATIVE CAPACITY – San Jacinto Basin~~

~~The groundwater subbasins in the San Jacinto Watershed were evaluated for water quality and assimilative capacity in a study conducted by SAWPA from 1987-1989. The study covered both TDS and nitrate quality of groundwaters. For the San Jacinto Basin, the study was only superficial in depth and extent. There have been many changes in water supply, wastewater disposal, and reclamation since that time.~~

~~The Graben area, which consists of the Canyon, Intake, Upper Pressure, and Lower Pressure Subbasins, was modeled with moderate detail; the other seven subbasins in the San Jacinto watershed were modeled in less detail. The data available for nitrate modeling was meager and therefore the nitrate quality projections should be considered only approximate.~~

~~Results of projected subbasin groundwater quality for TDS indicated that all of the San Jacinto groundwater basins with the exception of the Canyon Subbasin have assimilative capacity for~~

~~planned TDS wasteloads. The Canyon Subbasins exceeds the TDS water quality objective at the present time and at the end of the planning period (2005). Lakeview and Hemet Subbasins exceed their respective TDS water quality objective at the present time (1990 and 1995), but do show improvement in the future. There are mitigation programs being developed for the Hemet Subbasin, as described below.~~

~~Based on model projections, the following subbasins in the San Jacinto watershed have no assimilative capacity for nitrate:~~

~~Canyon~~	~~Menifee I~~
~~Perris, North~~	~~Menifee II~~
~~Hemet~~	~~Lakeview~~

~~Presently, Eastern Municipal Water District is conducting studies of the Hemet Subbasin which should provide a better understanding of the quality problems and alternative mitigation measures (see Special Studies discussion). A desalter is planned for the Menifee I Subbasin. When these studies and efforts are completed or are further in the planning stages, any changes in the San Jacinto Management Plan will be incorporated into the Basin Plan.~~

~~Surface Water Management~~

~~Surface waters of the San Jacinto watershed are tributary to the Santa Ana River via Temescal Creek and therefore all probable flows from the watershed are incorporated into the Santa Ana River wasteload allocation for TDS and nitrate (see Tables 5-4 and 5-5).~~

~~Special Studies and Projects~~

~~Eastern Municipal Water District is involved in a number of studies and projects related to TDS and nitrogen management in the San Jacinto watershed. The results of these studies may lead to changes in the Basin Plan. Descriptions of these studies are included in Chapter 7.~~

~~Menifee Basin Desalter~~

~~A desalter in the Menifee I Subbasin is being planned by Eastern Municipal Water District as part of an effort to decrease dependency on costly and unreliable imported water and to recover high TDS groundwater in the Menifee Subbasin. Agricultural activities and the hydrologic nature of the basin have caused TDS concentrations to rise to an average of 2000mg/L.~~

~~The Menifee Desalter would extract approximately 3MGD of degraded water. The water would be treated by either reverse osmosis (RO) or electrodialysis. The product water would be blended with groundwater source with TDS averaging 500mg/L. The waste brine would be disposed of via the Santa Ana Regional Interceptor line (SARI line).~~

~~SALT BALANCE AND ASSIMILATIVE CAPACITY – LOWER Santa Ana Basin~~

~~The Santa Ana River recharges Orange County groundwater subbasins. Rapid percolation basins located in the Santa Ana River streambed are operated and maintained by Orange County Water District (OCWD). OCWD also owns and operates a number of other recharge pits, ponds, and basins in the Santa Ana Forebay area which are supplied with the Santa Ana River water via pipelines.~~

~~Groundwater makes up approximately 63% of the total product water supply for the OCWD area. The river and several very small tributaries provide about half of the groundwater recharge. The River flow is made up of base flow and storm flow components. Baseflow generally provides 70% or~~

~~more of the water recharged. In rare wet years, baseflow accounts for a smaller, but still significant percentage (40%) of the recharge. Therefore, to protect Orange County groundwater it is essential to control the quality of baseflow. Most of the baseflow (80-90%) is composed of treated sewage effluent; it also includes nonpoint source inputs and rising groundwater in the river.~~

~~In part, water quality objectives are established for the Santa Ana River in order to protect the Orange County aquifers (see discussion in Chapter 4). In addition, water quality objectives are specified for the Santa Ana Forebay. The relationship between the water quality of the Santa Ana River and the Orange County subbasin quality needs to be investigated in order to assure that water quality objectives and control measures are appropriate.~~

~~**Special Projects**~~

3. Orange County

~~Water Factory 21~~

~~Water Factory 21, which has been in operation since 1976, provides advanced treatment of wastewater for groundwater injection. Water Factory 21 produces 75,000 acre-feet of highly treated reclaimed wastewater for injection into the OCWD's seawater intrusion barrier. This highly treated water serves not only to keep salt water from contaminating inland wells, but also adds to the supply of available groundwater.~~

~~Tustin Nitrate Removal Project~~

The Tustin Nitrate Removal project, ~~which was completed in 1990~~ which began operation in 1996 , ~~will~~ added approximately 3,000 acre-feet of water annually to Tustin's domestic water supply. Treatment systems employing reverse osmosis and ion exchange are operating at two wells that had been shut down because of excessive nitrate concentrations.

~~Irvine Desalter~~

The Orange County Water District and Irvine Ranch Water District (IRWD) are moving forward with the Irvine Desalter, a dual-purpose regional groundwater remediation and water supply project located in the City of Irvine and its sphere of influence. The project consists of an extensive seven-well groundwater extraction and collection system, a treatment system, a five-mile brine disposal pipeline, a finished water delivery system, and ancillary facilities. While providing approximately 6,700 acre-feet per year to IRWD for potable supply, the ~~project~~ desalter will extract and treat brackish groundwater and ~~as well as~~ capture an overlapping regional plume of TCE-contaminated groundwater demonstrated to have originated from the U.S. Marine Corps Air Station-El Toro. ~~Approximately 5,400 tons of salt per year will be removed from the basin with this project. The Irvine Desalter is expected to be on line by February 1996.~~

~~Frances Groundwater Desalter~~

~~IRWD is planning the Frances Groundwater Desalter, a dual-purpose regional groundwater remediation and water supply project located in the City of Tustin and the City of Irvine. The project consists of an extensive six-well groundwater extraction and collection system, a treatment system, a brine disposal pipeline, a finished water delivery system, and ancillary facilities. While providing approximately 11,300 acre-feet per year to IRWD for potable supply, the project will extract and treat water with nitrate concentrations above the drinking water standard (45mg/L). Approximately 4,100 tons of salt per year will be removed from the basin with this project. The Frances Groundwater Desalter is planned to be on line in 1995.~~

C. Recharge of Stormwater and/or Imported Water

The Orange County Water District, San Bernardino Valley Water Conservation District and other agencies in the Region operate extensive facilities designed to enhance the capture and recharge of high quality stormwater. More such facilities are planned as part of "maximum benefit" proposals by the Chino Basin Watermaster/Inland Empire Utilities Agency, Yucaipa Valley Water District, San Timoteo Watershed Management Authority and the City of Beaumont (section VI., Maximum Benefit Implementation Plans for Salt Management). These proposals also include efforts to import and recharge high quality State Water Project water, when it is available. These activities increase both the quantity and quality of available groundwater resources.

D. Sea Water Intrusion Barriers

The Orange County Water District operates advanced facilities designed to provide significantly enhanced tertiary treatment of secondary treated municipal wastewater from the Orange County Sanitation District's (Sanitation District) Fountain Valley Reclamation Plant No. 1. The recycled water is injected into a series of wells located along Ellis Avenue in the City of Fountain Valley to maintain the Talbert Gap Seawater Intrusion Barrier. The treatment facility, currently known as Water Factory 21, will be supplanted by the Groundwater Replenishment System (GWRS) being constructed jointly by Orange County Water District and the Sanitation District (see preceding section on wastewater reclamation).

V. Salt Management Plan -- Monitoring Program Requirements

California Water Code Section 13242 specifies that Basin Plan implementation plans must contain a description of the monitoring and surveillance programs to be undertaken to determine compliance with water quality objectives. The adoption of new groundwater TDS and nitrate-nitrogen water quality objectives (Chapter 4) in response to the studies sponsored by the N/TDS Task Force triggered the need to develop and implement a new, watershed-wide nitrogen/TDS monitoring program. The Task Force provided additional impetus for this comprehensive monitoring program. The Task Force recommended that future review and update of the salt management plan, including findings of assimilative capacity, appropriate changes to the wasteload allocations, etc., should be based on real-time data obtained through a rigorous monitoring program, rather than on model projections. As discussed earlier (see Section II., Update of the Total Dissolved Solids/Nitrogen Management Plan), the Task Force concluded that the development of new, workable modeling tools to assist in this review was beyond the scope and financial capability of the Task Force.

The monitoring program must consist of both surface water and groundwater components. Some of these are already being implemented, including the annual sampling of the Santa Ana River, Reach 3 at Prado Dam by Regional Board staff (see Chapter 4 and below). Certain agencies have committed to conduct monitoring of specific water bodies as part of their "maximum benefit" proposals (see Section VI., Maximum Benefit Implementation Plans for Salt Management, below). The N/TDS Task Force members, and other parties as appropriate, will be required to propose a comprehensive monitoring program that would integrate these existing commitments with other monitoring recommendations. These parties will be required to implement this program upon approval by the Regional Board.

A. Surface Water Monitoring Program Requirements for TDS and Nitrogen

Implementation of a surface water monitoring program is needed to determine compliance with the nitrogen and TDS objectives of the Santa Ana River, and thereby, the effectiveness of the wasteload allocations. It is also needed to provide data required to evaluate the effects of surface water discharges on affected groundwater management zones. In particular, data are needed to confirm the validity of the 50% nitrogen loss coefficient that will be applied in regulating discharges to that part of Reach 3 of the River that overlies the Chino South groundwater management zone (see Section III.B.3., Nitrogen loss coefficients).

As discussed in Chapter 4, the Basin Plan specifies baseflow TDS and total nitrogen objectives for Reach 3 of the River. For Reach 2, a TDS objective based on a five-year moving average of the annual TDS concentration is specified. Use of this moving average allows the effects of wet and dry years to be integrated over the five-year period and reflects the actual long-term quality of water recharged by Orange County Water District downstream of Prado Dam.

The Basin Plan specifies a monitoring program to determine compliance with the Reach 3 baseflow objectives at Prado Dam (see Chapter 4). As noted above, Regional Board staff conducts this program on an annual basis. Measurement of baseflow quality, rather than the quality of flows in Reach 2, has long been used to indicate the effects of recharge of Santa Ana River flows on Orange County groundwater. The efficacy of this approach was evaluated as part of the 2004 update of the TDS/nitrogen management plan in the Basin Plan. Insufficient data were available to draw a direct correlation between the long-term TDS and nitrogen quality of River flows at Prado Dam and that of affected Orange County groundwater. However, the conclusion drawn was that reliance on the Reach 3 baseflow objectives to protect Orange County groundwater, and the existing monitoring program designed to measure compliance, is adequate.

In addition to this baseflow sampling program and the surface water monitoring commitments associated with certain agencies' "maximum benefit" programs, the comprehensive monitoring program to be proposed and implemented by the Task Force members, and other agencies as appropriate, must include an evaluation of compliance with the TDS and nitrogen objectives for Reaches 2, 4 and 5 of the Santa Ana River. Compliance with the Reach 2 TDS objective can be determined by evaluation of data collected by the Santa Ana River Watermaster, Orange County Water District, the United States Geological Survey, and others.

Surface water monitoring program requirements for TDS and nitrogen are as follows:

1. No later than (**3 months from effective date of this Basin Plan amendment* *), Orange County Water District, Inland Empire Utilities Agency, Chino Basin Watermaster, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal Water District, City of Colton, City of San Bernardino Municipal Water Department, City of Redlands, Jurupa Community Services District, Western Riverside County Regional Wastewater Authority , Lee Lake Water District, Yucaipa Valley Water District, City of Beaumont, the San Timoteo Watershed Management Authority and the City of Rialto shall submit to the Regional Board for approval, a proposed surface water TDS and nitrogen monitoring program that will provide an evaluation of compliance with the TDS and nitrogen objectives for Reaches 2, 4 and 5 of the Santa Ana River.

   In lieu of this coordinated monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group monitoring plan. Any such individual or group monitoring plan shall also be submitted no later than (**3 months from effective date of this Basin Plan amendment* *).

2. By April 15th of each year, the Orange County Water District, Inland Empire Utilities Agency, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal

Water District, Lee Lake Water District, City of Colton, City of San Bernardino Municipal Water Department, Jurupa Community Services District, Western Riverside County Wastewater Agency, Yucaipa Valley Water District, City of Beaumont, the San Timoteo Watershed Management Authority and the City of Rialto, shall submit an annual report of Santa Ana River, Reach 2 , 4 and 5 water quality. Data evaluated shall include that collected by the Santa Ana River Watermaster, Orange County Water District, and the US Geologic Survey, at a minimum.

In lieu of this coordinated annual report, one or more of the parties identified in the preceding paragraph may submit an individual or group annual report. Any such individual or group report shall also be submitted by February 15th of each year.

Additional surface water monitoring programs may be specified by the Regional Board depending upon watershed conditions, waste discharge specifications and/or any special studies related to TDS and nitrogen.

B. Groundwater Monitoring Program for TDS and Nitrogen

Implementation of a watershed-wide TDS/nitrogen groundwater monitoring program is necessary to assess current water quality, to determine whether TDS and nitrate-nitrogen water quality objectives for management zones are being met or exceeded, and to update assimilative capacity findings. Groundwater monitoring is also needed to fill data gaps for those management zones with insufficient data to calculate TDS and nitrate-nitrogen historical quality and current quality. Finally, groundwater monitoring is needed to assess the effects of POTW discharges to surface waters on affected groundwater. In particular, monitoring is needed to confirm the 50% nitrogen loss coefficient for discharges to that part of the Santa Ana River, Reach 3 that affect the Chino South Management Zone.

Groundwater monitoring requirements for TDS and nitrogen are as follows:

1. No later than (**6 months from effective date of this Basin Plan amendment* *), Orange County Water District, Irvine Ranch Water District, Inland Empire Utilities Agency, Chino Basin Watermaster, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal Water District, City of Colton, City of San Bernardino Municipal Water Department, City of Redlands, Jurupa Community Services District, Western Riverside County Regional Wastewater Authority , Lee Lake Water District, Yucaipa Valley Water District, City of Beaumont, the San Timoteo Watershed Management Authority and the City of Rialto shall submit to the Regional Board for approval, a proposed watershed-wide TDS and nitrogen monitoring program that will provide data necessary to review and update the TDS/nitrogen management plan. Data to be collected and analyzed shall address, at a minimum: (1) determination of current ambient quality in groundwater management zones; (2) determination of compliance with TDS and nitrate-nitrogen objectives for the management zones; (3) evaluation of assimilative capacity findings for groundwater management zones; and (4) assessment of the effects of recharge of surface water POTW discharges on the quality of affected groundwater management zones. The determination of current ambient quality shall be accomplished using methodology consistent with that employed by the Nitrogen/TDS Task Force (20-year running averages) to develop the TDS and nitrogen water quality objectives included in this Basin Plan. [Ref. 1] The determination of current ambient groundwater quality throughout the watershed must be reported by July 1, 2005, and, at a minimum, every three years thereafter.

   In lieu of this coordinated monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group monitoring plan. Any such individual or group monitoring plan shall also be due no later than (*6 months from effective date of this Basin Plan amendment *).

Details to be included in the proposed monitoring program shall include, but not be limited to, the following:

- Monitoring program goals
- responsible agencies
- groundwater water sampling locations
- surface water sampling locations (if appropriate)
- water quality parameters
- sampling frequency
- quality assurance/quality control
- database management
- data analysis and reporting

Within 30 days of Regional Board approval of the proposed monitoring plan, the monitoring plan must be implemented.

2. No later than (*6 months from effective date of this Basin Plan amendment *) the City of Colton, City of San Bernardino Municipal Water Department, City of Riverside, Jurupa Community Services District, Western Riverside County Wastewater Agency and the City of Rialto, shall submit to the Regional Board for approval, a monitoring program that will be utilized to confirm the 50% Santa Ana River, Reach 3 nitrogen loss coefficient.

   In lieu of this coordinated monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group monitoring plan. Any such individual or group monitoring plan shall also be due no later than (*6 months from effective date of this Basin Plan amendment *).

   Within 30 days of Regional Board approval of the monitoring plan, the monitoring program must be implemented.

Additional groundwater monitoring programs may be specified by the Regional Board depending upon watershed conditions, waste discharge specifications and/or any special studies related to TDS and nitrogen.

VI. Maximum Benefit Implementation Plans for Salt Management

As discussed in Chapter 4, with some limited exceptions, TDS and nitrate-nitrogen objectives for groundwater management zones in the Santa Ana Region were established to ensure that historical quality is maintained, pursuant to the State's antidegradation policy (State Board Resolution No. 68-16). However, alternative, less stringent "maximum benefit" objectives are also specified in Chapter 4 for certain groundwater management zones. These "maximum benefit" objectives, which would allow the lowering of water quality, were established based on demonstrations by the agencies recommending them that antidegradation requirements were satisfied. First, these agencies demonstrated that beneficial uses would continue to be protected. Second, these agencies showed that water quality consistent with maximum benefit to the people of the state would be maintained. Other factors, such as economics, the need to use recycled water, and the need to develop housing in the area were also taken into account in establishing the objectives (see Chapter 4).

The demonstrations of "maximum benefit" by these agencies are contingent on the implementation of specific projects and programs by the agencies. As discussed in Chapter 4, if these projects and programs are not implemented to the Regional Board's satisfaction, then the alternative "antidegradation" objectives apply to these waters for regulatory purposes.

This section identifies the specific commitments by the Chino Basin Watermaster and Inland Empire Utilities Agency, the Yucaipa Valley Water District, the City of Beaumont and the San Timoteo Water Management Authority to implement projects and programs to support the "maximum benefit" objectives established for groundwater management zones affected by their wastewater and water management practices.

A. Salt Management – Chino Basin and Cucamonga Basin

As shown in Chapter 4, both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen are specified in this Plan for certain parts of the Chino Basin and the Cucamonga groundwater Management Zone. The application of the "maximum benefit" objectives relies on the implementation by the Chino Basin Watermaster and the Inland Empire Utilities Agency of a specific program of projects and requirements [Ref. 10B], which are an integral part of the Chino Basin Optimum Basin Management Program (OBMP) [Ref. 10C]. The OBMP was developed by the Watermaster under the supervision of the San Bernardino County Superior Court. The OBMP is a comprehensive, long-range water management plan for the Chino Basin as a whole, including the Chino North (or Chino 1, 2, and 3) and Cucamonga Management Zones. The OBMP includes the use of recycled water for basin recharge, initially in the Chino North Management Zone. Recycled water recharge in the Cucamonga Management Zone may be pursued in the future. The OBMP also includes the capture of increased quantities of high quality storm water runoff, recharge of imported water when its TDS concentrations are low, improvement of water supply by desalting poor quality groundwater, and enhanced wastewater pollutant source control programs. The OBMP maps a strategy that will provide for enhanced yield for the Chino Basin and seeks to provide reliable water supplies for development expected to occur within the Basin. The OBMP also includes the implementation of management activities that would result in the hydraulic isolation of Chino Basin groundwater from the Orange County Management Zone, thus insuring the protection of downstream beneficial uses and water quality.

Table 5-8a identifies the projects and requirements that must be implemented to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained. An implementation schedule is also specified. The Regional Board will revise IEUA's waste discharge requirements, issue appropriate permits to the Chino Basin Watermaster, and utilize the authority provided by Section 13267 of the Water Code as necessary to require that these commitments be met. It is assumed that maximum benefit is demonstrated, and that the "maximum benefit" TDS and nitrate-nitrogen objectives apply to the Chino North and Cucamonga Management Zones as long as the schedule is being met. If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-8a, then maximum benefit is not demonstrated, and the "antidegradation" TDS and nitrate-nitrogen objectives for the Chino 1, 2, and 3 and Cucamonga Management Zones apply. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges to these management zones that took place in excess of limits based on the "antidegradation" objectives.

Table 5-8a

Chino Basin Maximum Benefit Commitments

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
1. Surface Water Monitoring Program	
a. Submit Draft Monitoring Program to Regional Board	a. *(*30 days from date of approval of this amendment*)*
b. Implement Monitoring Program	b. Within 30 days from date of Regional Board approval of monitoring plan
c. Quarterly data report submittal	c. April 15, July 15, October 15, January 15
d. Annual data report submittal	d. February 15th
2. Groundwater Monitoring Program	
a. Submit Draft Monitoring Program to Regional Board	a. *(*30 days from date of approval of this amendment*)*
b. Implement Monitoring Program	b. Within 30 days from date of Regional Board approval of monitoring plan
c. Annual data report submittal	c. February 15th
3. Chino Desalters	
a. Chino 1 desalter expansion to 10 MGD	a. Prior to recharge of recycled water
b. Chino 2 desalter at 10 MGD design	b. Recharge of recycled water allowed once award of contract and notice to proceed issued for construction of desalter treatment plant
4. Future desalters plan and schedule submittal	October 1, 2005 Implement plan and schedule upon Regional Board approval
5. Recharge facilities (17) built and in operation	June 30, 2005
6. IEUA wastewater quality improvement plan and schedule submittal	60 days after agency-wide 12 month running average effluent TDS quality equals or exceeds 545 mg/L for 3 consecutive months or agency-wide 12 month running average TIN equals or exceeds 8 mg/L in any month. Implement plan and schedule upon approval by Regional Board

Table 5-8a

Chino Basin Maximum Benefit Commitments (cont.)

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
7. Recycled water will be blended with other recharge sources so that the 5-year running average TDS and nitrate-nitrogen concentrations of water recharged are equal to or less than the "maximum benefit" water quality objectives for the affected Management Zone (Chino North or Cucamonga).	Compliance must be achieved by end of 5th year after initiation of recycled water recharge operations.
a. Submit a report that documents the location, amount of recharge, and TDS and nitrogen quality of stormwater recharge before the OBMP recharge improvements were constructed and what is projected to occur after the recharge improvements are completed	a. Prior to initiation of recycled water recharge
b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For stormwater recharge used for blending, submit documentation that the recharge is the result of CBW/IEUA enhanced recharge facilities.	b. Annually, by February 15th, after initiation of construction of basins/other facilities to support enhanced stormwater recharge.
8. Hydraulic Control Failure	
a. Plan and schedule to correct loss of hydraulic control	a. 60 days from Regional Board finding that hydraulic control is not being maintained
b. Achievement and maintenance of hydraulic control	b. In accordance with plan and schedule approved by Regional Board. The schedule shall assure that hydraulic control is achieved as soon as possible but no later than 180 days after loss of hydraulic control is identified.
c. Mitigation plan for temporary failure to achieve/maintain hydraulic control	c. By *(*30 days from effective date of this Basin Plan amendment*)*. Implement plan upon Regional Board determination that hydraulic control is not being maintained.
9. Ambient groundwater quality determination	July 1, 2005 and every 3 years thereafter

Description of Chino Basin Watermaster and Inland Empire Utilities Agency Commitments

1. Surface Water Monitoring Program (Table 5-8a #1)

The Chino Basin Watermaster (Watermaster), in conjunction with staff of the Orange County Water District and Regional Board, has developed a proposed surface water monitoring program. By (**30 days from date of approval of this amendment*) and prior to the discharge of recycled water to the Chino Basin, Watermaster shall submit the recommended surface water monitoring program to the Regional Board for approval. The monitoring program must be implemented within 30 days of Regional Board approval, and six months of data must be generated prior to the discharge of recycled water to the Chino Basin.

At a minimum, the surface water monitoring program shall include the collection of bi-weekly measurements of general minerals and nitrogen components at the locations listed in Table 5-8b. Data reports shall be submitted to the Regional Board Executive Officer by April 15, July 15, October 15, and January 15 each year. An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by February 15th of each year.

2. Groundwater Monitoring Program (Table 5-8a, #2)

The purpose of the Groundwater Monitoring Program is to (1) identify potential impacts from implementation of the Chino Basin "maximum benefit" water quality objectives on water levels and water quality within the Chino Basin and in downgradient basins and (2) determine whether hydraulic control (see # 8, below) is being achieved and maintained. By (*within 30 days from date of approval of this amendment*) and prior to the discharge of recycled water to the Chino Basin, Watermaster shall submit to the Regional Board for approval a proposed groundwater monitoring program to determine hydraulic control and ambient water quality in the Chino North and Cucamonga Management Zones. Within 30 days of Regional Board approval of the monitoring plan, the groundwater monitoring program must be implemented.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by February 15th of each year.

3. Chino 1 and Chino 2 Desalters (Table 5-8a, # 3)

Prior to the recharge of recycled water in the Chino Basin, the Chino 1 desalter must be expanded and in operation at a capacity of 10 million gallons per day (MGD). Also, contracts for the construction of the Chino 2 desalter treatment plant must be awarded and a notice to proceed with the construction must be given prior to recharge of recycled water.

4. Future Desalter Development (Table 5-8a, # 4)

No later than October 1, 2005, the schedule for implementation of the next 20 MGD of desalter capacity, pursuant to the Peace Agreement that implements the Chino Basin OBMP, and as required by the San Bernardino Superior Court, must be submitted to the Regional Board by the Chino Basin Watermaster. IEUA and/or the Chino Basin Watermaster and/or other responsible parties deemed acceptable by the Executive Officer, will initiate building of the next desalter when the 12-month running average effluent concentration (measured as an average for all IEUA wastewater treatment facilities) reaches 545 mg/L TDS for three consecutive months.

Table 5-8b

Surface Water Monitoring Sites for Monitoring of Surface Water and Groundwater Quality Near the River to Determine the Presence and Source of Rising Groundwater

Site Name	Discharge	Owner	Type	Discharge Monitoring		Water Quality Monitoring		
				Frequency	Period	Frequency	Period	Analyses
11066460	Santa Ana Riv.	USGS	Total Discharge	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
11072100	Temescal Cr.	USGS	Total Discharge	Bi-weekly	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
11073495	Cucamonga Cr.	USGS	Total Discharge	Bi-weekly	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
11073440	Chino Cr.	USGS	Total Discharge	Bi-weekly	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
11074000	Santa Ana Riv.	USGS	Total Discharge	Bi-weekly	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RWQCP Direct	Recycled Water	Riverside	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RWQCP Hidden Valley	Recycled Water	Riverside	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
Corona RW	Recycled Water	Corona	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RP1 Cucamonga	Recycled Water	IEUA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RP1 Prado	Recycled Water	IEUA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RP2	Recycled Water	IEUA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
Carbon Canyon	Recycled Water	IEUA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
RP5	Recycled Water	IEUA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
WRCRWTP	Recycled Water	WR-JPA	Recycled Water	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-MWDXING	Santa Ana Riv.	OCWD	Total Discharge	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-HOLELK-01	Hole Lake	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-VANBUREN	Santa Ana Riv.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-ETIWANDA-01	Santa Ana Riv.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-HAMNER-01	Santa Ana Riv.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-RIV.RD	Santa Ana Riv.	OCWD	Total Discharge	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-DIV-PRADOWTLNDS	Santa Ana Riv.	OCWD	Total Discharge	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
SAR-BELOWDAM-01	Santa Ana Riv.	OCWD	Total Discharge	Daily	Jan - Dec	Bi-weekly	Jan - Dec	Gen. Min. & Physical
CK-CHINO	Chino Cr.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
CK-MILL	Cucamonga Cr.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical
CK-TEMESCAL	Temescal Cr.	OCWD	Total Discharge	Bi-weekly	May-Sep	Bi-weekly	Jan - Dec	Gen. Min. & Physical

(Source: Ref. 10B)

5. Recharge Facilities (Table 5-8a, # 5)

By June 30, 2005, or no later than one year from the start of discharge of recycled water, the 17 recharge facilities identified in the August 2001 Watermaster Recharge Master Plan and as updated by the Watermaster and IEUA, must be completed and operated to maximize the capture of storm water in the Chino Basin. The Watermaster has also committed to optimize the recharge of imported water in the Chino Basin based on the goal of maximizing recharge of State Project water when the TDS of that water is lowest

The Watermaster proposal recognizes the importance and necessity of recharge of both storm water and imported water to meet the water supply demands on the Chino Basin. Recharge of high quality supplies to the Chino Basin is necessary to offset the quality effects of recycled water and to achieve an ambient water quality equal to or better than the “maximum benefit” TDS and nitrate-nitrogen water quality objectives.

6. IEUA Wastewater Effluent Quality (Table 5-8a, # 6)

Within 60 days after the IEUA 12-month running average effluent concentration (measured as an average for all IEUA wastewater treatment facilities) for TDS exceeds 545 mg/L for 3 consecutive months, or the 12-month running average total inorganic nitrogen (TIN) concentration (measured as an average for all IEUA wastewater treatment facilities) exceeds 8 mg/L in any month, the IEUA shall submit to the Regional Board a plan and time schedule for implementation of measures to insure that the12-month running average agency wastewater effluent quality does not exceed 550 mg/L and 8 mg/L for TDS and TIN, respectively. The Plan and schedule are to be implemented upon Regional Board approval.

7. Recycled Water Use (Table 5-8a, # 7)

The use and recharge of recycled water within the Chino Basin is a critical component of the Watermaster OBMP and is necessary to maximize the use of the water resources of the Chino Basin. The demonstration of maximum benefit, and the continued application of the “maximum benefit” TDS and nitrate-nitrogen water quality objectives, depends on the recharge to the Chino North Management Zone of 5-year annual average (running average) TDS and nitrogen concentrations of no more than 420 mg/L and 5 mg/L, respectively. If and when recycled water recharge in the Cucamonga Management Zone is pursued, the application of the “maximum benefit” objectives will depend on the recharge to that zone of 5-year running average TDS and nitrogen concentrations no greater than 380 mg/L and 5 mg/L, respectively. IEUA has committed to meeting these levels and recognizes that the maximum benefit objectives depend on achieving these 5-year running average concentrations.

Accordingly, the use of recycled water for groundwater recharge shall be limited to the amount that can be blended on a volume-weighted basis with other sources of recharge to the management zone to achieve a 5-year running average concentration equal to or less than the “maximum benefit” TDS and nitrogen water quality objectives of the affected Management Zone (Chino North or Cucamonga) The 25% nitrogen loss coefficient will be applied to calculate recycled water nitrogen quality when determining the amount of recharge of other water sources that must be achieved to meet the 5-year running averages.

8. Hydraulic Control (Table 5-8a, # 8)

“Hydraulic Control” is defined as eliminating groundwater discharge from the Chino Basin to the Santa Ana River, or controlling the discharge to *de minimis* levels. The surface water and groundwater monitoring programs described above are intended to demonstrate whether hydraulic control is achieved and maintained. In the event that the Regional Board finds that hydraulic control is not being accomplished, the Watermaster shall submit to the Regional Board within 60 days of that finding a plan and time schedule to correct (within 180 days from the Regional Board approval of the plan and schedule) the failure to achieve and maintain hydraulic control.

By (*within 30 days of the approval of this Basin Plan amendment*), the Watermaster and IEUA shall prepare a proposed plan and schedule to mitigate temporary losses of hydraulic control. These agencies must implement this plan upon a determination by the Regional Board that hydraulic control is not being achieved or maintained.

9. Ambient Groundwater Quality Determination (Table 5-8a, # 9)

By July 1, 2005, and every three years thereafter, Watermaster shall submit a determination of ambient TDS and nitrate-nitrogen quality in the Chino North and Cucamonga Management Zones. This determination shall be accomplished using methodology consistent with the determinations (20-year running averages) used by the TDS/Nitrogen Task Force to develop the “antidegradation” TDS and nitrate-nitrogen water quality objectives for groundwaters subbasins within the Region. [Ref. 1].

Implementation by Regional Board

1. Revision of the Inland Empire Utilities Agency NPDES Permits

To implement the “maximum benefit” objectives, the Regional Board will revise the NPDES permits for IEUA wastewater discharges to reflect the commitments described above, as appropriate. This includes the following. TDS and TIN (includes nitrate-nitrogen) limits of 550 mg/L and 8 mg/L, respectively, will be specified as an agency-wide, volume weighted-average. The limits will be expressed as 12-month running averages. These limits implement the wasteload allocations for IEUA surface water discharges (see Table 5-5), and are not contingent on the “maximum benefit” objectives or demonstration[6]. IEUA will be required to implement measures to improve effluent quality when the 12 month running average effluent concentration (measured as an average for all IEUA treatment facilities) exceeds 545 mg/L for 3 consecutive months, or when the 12-month running average total inorganic nitrogen concentration (also measured as an average for all IEUA treatment facilities) exceeds 8 mg/L in any month. The permits will require that recycled water used for recharge shall be limited to the amount that can be blended in the management zone with other water sources, such as stormwater or imported water, to achieve 5-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the affected management zone (Chino North or Cucamonga). Recycled water recharge is not currently contemplated in other parts of the Chino Basin. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge in the Chino 1, 2 and 3 and Cucamonga Management Zones. These limits will apply should the Regional Board find that maximum benefit is not demonstrated. If recharge projects are implemented elsewhere in the Chino Basin, TDS and TIN limits will be based on the TDS and nitrate-nitrogen objectives of the affected management zones.

The effluent limits for IEUA, which establish an upper limit on TDS and TIN concentrations of recycled water discharged in the basin, are a cornerstone of the maximum benefit demonstration. The

[6] Surface water discharges by IEUA do not affect the groundwater management zones for which “maximum benefit” objectives are specified. Thus, the wasteload allocations do not vary depending on whether or not the “maximum benefit” objectives apply.

cap on effluent TDS and TIN concentrations provides a controlling point for management of TDS and nitrogen water quality in the Chino Basin. The TDS in IEUA's effluent is expected to reach 550 mg/L before the groundwater in the Chino North Management Zone or the Cucamonga Management Zone reaches the "maximum benefit" objectives of 420 mg/L and 380 mg/L, respectively. The IEUA/Chino Basin Watermaster maximum benefit proposal commits to the initiation of construction of another Chino Basin desalter when the TDS in IEUA's effluent reaches 545 mg/L for three consecutive months. This desalter may be constructed by IEUA and/or Chino Basin Watermaster and/or other responsible parties deemed acceptable by the Executive Officer. Further, IEUA will immediately implement a salt management program to reduce the salts, including nitrogen, entering IEUA's wastewater treatment plants. This salt management program will include: 1) connection of new industries that have wastewater discharges with TDS greater than 550 mg/L to the brine line; 2) regulation of the use of new and existing water softeners to the extent allowed by law, with incentives provided for the removal of on-site regenerative water softeners and the use of exchange canisters or other off-site regenerative systems; 3) connection of existing domestic system industries with high TDS waste discharges to the brine lines; 4) percolation of State Water Project water into the Chino Basin when that water is low in TDS; and 5) development of a plan for sewering areas presently served by septic tanks to reduce the nitrogen loading into the Chino and Cucamonga Management Zones. IEUA's permits will reflect these commitments.

Implementing these measures will assure that the groundwater quality remains at or below the Chino North Management Zone objective of 420 mg/L and the Cucamonga Management Zone objective of 380 mg/L. Maintenance of this ambient groundwater quality is necessary, in turn, to assure that IEUA's wastewater treatment facilities are able to meet the effluent TDS limits. Chino Basin groundwater is a significant component of the water supplied in IEUA's service area and its quality thus has an important effect on effluent quality. Poor ambient water quality will preclude IEUA from meeting effluent limits, without desalting. IEUA can revise treatment plant operations to assure that the TIN limit is achieved. These TDS and TIN limitations assure beneficial use protection for Chino Basin and downstream Orange County groundwater, as well as surface waters (including Chino Creek and the Santa Ana River) affected by IEUA discharges.

IEUA's revised permits will also reflect the surface and groundwater monitoring program requirements described above.

2. Issuance of permits to Chino Basin Watermaster

The Regional Board will issue appropriate permits to the Watermaster, individually or jointly with IEUA, for the recharge of recycled water in the Basin. These permits will implement the commitments described above for recharge of other water sources to offset the quality of the recycled water. The parties will be required to document the amount, quality and location of recharge of these other sources, and to demonstrate that stormwater recharge used for blending purposes occurred as the result of the parties' efforts to enhance such recharge. Other "maximum benefit" commitments will be reflected in these permits, or in other orders of the Regional Board, as appropriate.

3. Review of Project Status

No later than 2005, and every three years thereafter (to coincide with the Regional Board's triennial review process), the Regional Board intends to review the status of the activities planned and executed by the Watermaster and IEUA to demonstrate maximum benefit and to justify continued implementation of the "maximum benefit" water quality objectives. This review is intended to determine whether the commitments specified above and summarized in Table 5-8a are met. If, as a result of this review, the Regional Board finds that the Watermaster and IEUA commitments are not met, the Regional Board will make a finding that the lowering of water quality associated with TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the "antidegradation" objectives") is not of maximum benefit to the people of the state. By default, the scientifically derived, "antidegradation objectives" for the Chino 1, 2 and 3 and Cucamonga Management Zones would become effective (280 mg/L, 250 mg/L, 260 mg/L and 210 mg/L TDS respectively; 5.0 mg/L, 2.9 mg/L, 3.5 mg/L and 2.4 mg/L for nitrate-nitrogen – see Chapter 4).

The Watermaster and IEUA have made clear commitments to the implementation of projects and management strategies to achieve the "maximum benefit" objectives. A finding of "maximum benefit to the people of the state" is also a very strong commitment of support by the Regional Board for the goals, vision and future plans of the Watermaster and IEUA. Watermaster and IEUA have indicated that the supervision of the Watermaster program by the San Bernardino County Superior Court will ensure that the Watermaster and IEUA commitments are met. However, people change, commitments may be changed, and public agency decisions may certainly change. If the commitments are not met and "maximum benefit" is not demonstrated, then the Regional Board will require that Watermaster and IEUA mitigate the effects of discharges of recycled and imported water that took place under the maximum benefit objectives. Under this circumstance, mitigation will be required such that, after mitigation, the salt and nitrogen loads to the basin from imported water, newly captured stormwater inputs under the Watermaster enhanced stormwater interception program, and recycled water are made to be equivalent to the salt loads that would have been allowed to the Chino Basin under the antidegradation objectives. Discharges in excess of the antidegradation objectives that must be considered for mitigation include both recycled water and imported water at TDS concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load. (Desalting will be an effective mitigation strategy, but desalting removes water, as well as salt, and the resulting salt concentrations in the groundwater will not completely mitigate the effects of the maximum benefit discharges, if mitigation is considered simply on a salt load, rather than concentration, basis.) This remediation will be required of the agencies that were responsible for the discharge of recycled and imported water (waste discharge permit holders) under the maximum benefit objectives. The remediation must be completed within a 10-year period following the finding by the Regional Board that the antidegradation objectives apply. The Regional Board will also require mitigation of any adverse effects on water quality downstream of the Chino Basin that result from failure to implement the "maximum benefit" commitments.

B. Salt Management - San Timoteo Watershed

1. San Timoteo and Yucaipa Management Zone - Yucaipa Valley Water District

Two sets of objectives have been adopted for the San Timoteo and Yucaipa Management Zones; the "maximum benefit" objectives and objectives based on historic ambient quality ("antidegradation" objectives) (see Chapter 4). The application of the "maximum benefit" objectives relies on the implementation by the Yucaipa Valley Water District (YVWD) (and in the case of the San Timoteo Management Zone, by the City of Beaumont/STWMA (see discussion below)) of a specific program of projects and requirements [Ref. 10D]. This program is a part of a watershed-scale water resources management plan designed by YVWD and other members of the San Timoteo Watershed Management Authority (STWMA) (the City of Beaumont, the Beaumont-Cherry Valley Water District and the South Mesa Water Company) to assure reliable supplies to meet present and anticipated demands. The projected water demands for the Yucaipa area for the year 2030 require approximately an additional 10,000 AF/Y of supplemental water, including State Water Project water, water imported from local sources, recharged storm water and recycled water. YVWD is in the process of implementing the water resources management plan, which includes enhanced recharge of stormwater and recycled water, optimizing direct use of recycled and imported water, and conjunctive use.

In addition to its water supply responsibilities, YVWD provides sewage collection and treatment services within its service area. YVWD operates a wastewater treatment facility that currently discharges tertiary treated wastewater to San Timoteo Creek, Reach 3. This unlined reach of the Creek overlies and recharges the San Timoteo groundwater management zone.

Table 5-9a identifies the projects and requirements that must be implemented by YVWD to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained. An implementation schedule is also specified. The Regional Board will revise YVWD's waste discharge requirements to require that these commitments be met. It is assumed that maximum benefit is demonstrated, and that the "maximum benefit" water quality TDS and nitrate-nitrogen objectives apply to the Yucaipa and San Timoteo Management Zones, as long as the schedule is being met[7]. If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-9a (and in the case of the San Timoteo Management Zone, the commitments and schedule shown in Table 5-10a (see next section)), then maximum benefit is not demonstrated and the "antidegradation" TDS and nitrate-nitrogen objectives apply. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges affecting these management zones that took place in excess of limits based on the "antidegradation" objectives. As for Chino Basin Watermaster and Inland Empire Utilities Agency, discharges in excess of the antidegradation objectives that must be considered for mitigation include both recycled water and imported water, at TDS concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load.

[7] Application of "maximum benefit" objectives for the San Timoteo Management Zone is also contingent on the timely implementation of the commitments by the City of Beaumont and the San Timoteo Watershed Management Authority which are discussed in the next section.

Table 5-9a

Yucaipa Valley Water District Maximum Benefit Commitments

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
1. Surface Water Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Quarterly data report submittal d. Annual data report submittal	 a. (*30 days from effective date of this Basin Plan amendment*) b. Within 30 days from Regional Board approval of monitoring plan c. April 15, July 15, October 15, January 15 d. February 15th
2. Groundwater Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Annual data report submittal	 a. (*30 days from effective date of this Basin Plan amendment*) b. Within 30 days from Regional Board approval of monitoring plan c. February 15th
3. Desalter(s) and Brine Disposal Facilities a. Submit plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to operational as soon as possible but no later than 7 years from date of Regional Board approval of plan/schedule. b. Implement the plan and schedule	 a. Within 6 months of either of the following: i. When YVWD's effluent 5-year running average TDS exceeds 530 mg/L; and/or ii.. When volume weighted average concentration in the Yucaipa MZ of TDS exceeds 360 mg/L b. Within 30 days from Regional Board approval of monitoring plan
4. Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes. The non-potable supply shall comply with a 10-year running average TDS concentration of 370 mg/L or less	 *(*10 years from effective date of this Basin Plan amendment*)*

Description of Commitment	**Compliance Date – as soon as possible, but no later than**	
5. Recycled water recharge The recharge of recycled water in the Yucaipa or San Timoteo Management Zones shall be limited to the amount that can be blended with other recharge sources to achieve a 5-year running average equal to or less than the "maximum benefit" objectives for TDS and nitrate-nitrogen for the relevant Management Zone(s). a. Submit baseline report of amount, locations, and TDS and nitrogen quality of stormwater/imported water recharge. b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For stormwater recharge used for blending, submit documentation that the recharge is the result of YVWD enhanced recharge facilities/programs	Compliance must be achieved by end of 5th year after initiation of recycled water use/recharge operations. a. Prior to initiation of construction of basins/other facilities to support enhanced stormwater/imported water recharge. b. Annually, by January 15th, after initiation construction of facilities/implementation of programs to support enhanced recharge.	
6. Ambient groundwater quality determination	July 1, 2005 and every 3 years thereafter	
7. Replace denitrification facilities (necessary to comply with TIN wasteload allocation specified in Table 5-5)	New facilities shall be operational no later than (**3 years from effective date of this Basin Plan amendment**)	
8. YVWD recycled water quality improvement plan and schedule a. Submit plan and schedule b. Implement plan and schedule	a. 60 days after the TDS 12-month running average effluent quality equals or exceeds 530 mg/L for 3 consecutive months and/or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once replacement denitrification facilities are in place) b. Upon approval by Regional Board	
9. Remove/reduce the discharge of YVWD effluent from the unlined portion of San Timoteo Creek a. Submit proposed plan/schedule	a. (**6 months from effective date of this Basin Plan amendment)*	

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
b. Implement plan/schedule	b. Upon Regional Board approval
10. Construct the Western Regional Interceptor for Dunlap Acres a. Submit proposed construction plan and schedule. The schedule shall assure the completion of construction as soon as possible but no later than January 1, 2010. b. Implement plan and schedule	 a. (**6 months from effective date of this Basin Plan amendment)* b. Upon Regional Board approval

A. Description of Yucaipa Valley Water District Commitments

1. Surface Water Monitoring Program (Table 5-9a, # 1)

The YVWD shall develop and submit for Regional Board approval a surface water monitoring program for San Timoteo Creek and the Santa Ana River Reaches 4 and 5. The monitoring program must be implemented within 30 days of Regional Board approval of the monitoring plan, and six months of data must be generated prior to the implementation of any changes made to the effluent discharge points and before any recycled water is used in the Yucaipa or San Timoteo Management Zones.

At a minimum, the surface water monitoring program shall include the collection of monthly measurements of TDS and nitrogen components in San Timoteo Creek and Santa Ana River, Reaches 4 and 5 (see Table 5-9b). Data reports shall be submitted to the Regional Board's Executive Officer by April 15, July 15, October 15 and January 15 each year. An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by February 15^{th} of each year.

2. Groundwater Monitoring Program (Table 5-9a, #2)

The purpose of the Groundwater Monitoring Program is to identify the effects of the implementation of the San Timoteo and Yucaipa Management Zones maximum benefit water quality objectives on water levels and water quality within the San Timoteo and Yucaipa Management Zones. Prior to discharge of recycled water to the San Timoteo and/or Yucaipa Management Zones, YVWD shall submit to the Regional Board for approval a groundwater monitoring program to determine ambient water quality in the San Timoteo and Yucaipa Management Zones . The groundwater monitoring program must be implemented within 30 days of approval by the Regional Board.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by February 15^{th} of each year.

3. Desalters and Brine Disposal (Table 5-9a, #3)

YVWD anticipates that demineralization of groundwater or recycled water will be necessary in the future. YVWD is committed to construct and operate desalting and brine disposal facilities when:

1) The 5-year running average TDS concentration in recycled water produced at the YVWD wastewater treatment plant exceeds 530 mg/L; or

2) The volume-weighted TDS concentration in the Yucaipa Management Zone reaches or exceeds 360 mg/L

The construction of these facilities will be in accordance with a plan and schedule submitted by YVWD and approved by the Regional Board. The schedule shall assure that these facilities are in place within 7 years of Regional Board approval. These facilities shall be designed to stabilize or reverse the degradation trend evidenced by effluent and/or management zone quality.

4. Non-potable water supply distribution system (Table 5-9a, # 4)

A key element of the YVWD's water resources management plan is the construction of a non-potable supply system to serve a mix of recycled water and un-treated imported water for irrigation uses. The intent of blending these sources is to minimize the impact of recycled water use on the Yucaipa and San Timoteo Management Zones.

Parts of this system are under design and construction. A higher proportion of State Project water will be used in wet, surplus years, while larger amounts of recycled water will be used in dry, deficit years. YVWD will produce a non-potable supply with a running ten-year average TDS concentration less than the "maximum benefit" objective for the Yucaipa Management Zone (370 mg/L).

Table 5 – 9b

Surface Water Monitoring Sites for Monitoring Water Quality and Quantity
Yucaipa Valley Water District

Site Name	Discharge	Owner	Type	Discharge Monitoring Frequency	Discharge Monitoring Period	Water Quality Monitoring Frequency	Water Quality Monitoring Period	Water Quality Monitoring Analyses
11057500, Gage	San Timoteo Creek	USGS	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
At Barton Rd.	San Timoteo Creek	YVWD	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
At San Timoteo Canyon Rd.	San Timoteo Creek	YVWD	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Above confluence Yucaipa Creek	San Timoteo Creek	YVWD	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Above YVWD Discharge	San Timoteo Creek	YVWD	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
11059300 Gage	Santa Ana River	USGS	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
At Waterman Ave	Santa Ana River	YVWD	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Recharged to Yucaipa MZ	State Water Project	YVWD	Total Discharge	Monthly	Jan-Dec	Monthly	Jan-Dec	TDS, Nitrate-N
Recharged to Yucaipa MZ	Storm water	YVWD	Total Discharge	Monthly	Jan-Dec	Monthly	Jan-Dec	TDS, Nitrate-N

5. Recycled Water Use (Table 5-9a, # 5)

The use and recharge of recycled water within the Yucaipa Management Zone is a critical component of the YVWD water management plan and is necessary to maximize the use of the water resources of the Yucaipa area. The demonstration of “maximum benefit” and the continued application of the “maximum benefit” objectives depends on the combined recharge (recycled water, imported water, storm water) to the Yucaipa Management Zone of a 5-year annual average (running average) TDS concentration of 370 mg/L and nitrate-nitrogen concentration of 5 mg/L. If recycled water recharge in the proposed San Timoteo Management Zone is pursued, then the application of the “maximum benefit” objectives will depend on the combined recharge to that Zone of 5-year annual average (running average) concentrations of 400 mg/L or less TDS, and 5 mg/L or less nitrate-nitrogen.

To meet this requirement, YVWD will establish a fund to purchase imported water from local sources and/or the State Water Project and will recharge water with a TDS concentration less than 300 mg/L (recent long term historical average of water delivered from the State Project). YVWD will also pursue implementation, with the City of Yucaipa and the San Bernardino County Flood Control District, of the *Yucaipa Water Capture and Resource Management Complex* by December 31, 2010.

Accordingly, the use of recycled water for groundwater recharge in the Yucaipa or San Timoteo Management Zone shall be limited to the amount that can be blended in the management zone on a volume-weighted basis with other sources of recharge to achieve 5-year running average concentrations less than or equal to the "maximum benefit" objectives for the affected groundwater management zone. The 25% nitrogen loss coefficient will be applied in determining the amount of recharge of other water sources that must be achieved to meet the 5-year running average nitrogen concentrations.

6. Ambient Groundwater Quality Determination (Table 5-9a, # 6)

By July 1, 2005, and every three years thereafter, YVWD shall submit a determination of ambient TDS and nitrate-nitrogen quality in the San Timoteo and Yucaipa Management Zones. This determination shall be accomplished using methodology consistent with the calculation (20-year running averages) used by the Nitrogen/TDS Task Force to develop the TDS and nitrate-nitrogen "antidegradation" water quality objectives for groundwater management zones within the region. [Ref. 1].

7. Replacement of Denitrification Facilities (Table 5-9a, #7)

YVWD shall replace existing denitrification facilities to provide effluent total inorganic nitrogen quality (6 mg/L) needed to assure compliance with the "maximum benefit" nitrate-nitrogen objective of the San Timoteo and Yucaipa Management Zones (see Wasteload Allocation section of this Chapter). A maximum three year schedule for completion of these facilities will be required. This schedule will be specified in a revised NPDES permit for YVWD's discharges to San Timoteo Creek.

8. YVWD Recycled Water Management (Table 5-9a, #8)

YVWD expects to limit the TDS concentration in its effluent to less than or equal to 540 mg/L by using a low TDS source water supply for potable uses, selective desalting of either source water and/or recycled waters, and minimizing the TDS waste increment. YVWD is currently constructing a 12-MGD treatment plant to treat and serve State Project Water. The plant will also be able to treat low TDS Mill Creek and Santa Ana River water. When necessary, YVWD will construct desalters to reduce either the TDS concentration in water supplied to customers or the TDS concentration in the effluent. YVWD will also use best efforts to enact ordinances and other requirements to minimize the TDS use increment.

Within 60 days after the YVWD 12-month running average concentration for TDS equals or exceeds 530 mg/L for 3 consecutive months, or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once replacement denitrification facilities are in place), YVWD shall submit to the Regional Board a plan and time schedule for implementation of measures to insure that the average agency wastewater effluent quality does not exceed 540 mg/L and 6 mg/L for TDS and TIN, respectively. The plan and schedule are to be implemented upon approval by the Regional Board.

9. Relocation of San Timoteo Creek Discharge (Table 5-9a, #9)

YVWD has established the goal of eliminating its discharge to the unlined reach of San Timoteo Creek by 2008. First priority will be given to the direct reuse and limited recharge of this recycled water in the YVWD service area (principally the area overlying the Yucaipa Management Zone). The District may construct a pipeline to convey the recycled water to the San Jacinto watershed for reuse. The District is also planning the construction of a pipeline to convey recycled water downstream to the lined reach of the Creek (Reach 1A) to minimize recycled water effects on the San Timoteo Management Zone. In the long-term, discharges to this area of the Creek are likely to be infrequent and limited to the wintertime, when the recycled water cannot be used in the YVWD (or potentially, the San Jacinto) service areas. . However, YVWD is obligated to maintain flows in the Creek to support existing riparian habitat (State Board Order No. WW-26) and may need to continue recycled water discharges at some level. Groundwater and imported State Project water may also be used as alternative water sources.

Whole or partial removal of the discharge from the unlined reach of San Timoteo Creek would improve the quality of groundwater in the San Timoteo Management Zone and supplement recycled water supplies available for reuse elsewhere in the service area.

By *(6 months from effective date of this Basin Plan amendment)* YVWD shall submit a proposed plan and schedule to remove/reduce the discharge of recycled water to the unlined reach of San Timoteo Creek. The plan and schedule shall be implemented upon Regional Board approval.

9. Construction of Western Regional Interceptor (Table 5-9a, # 10)

YVWD will construct the Western Regional Interceptor to provide wastewater collection and treatment services to Dunlap Acres in order to mitigate what has been identified as a poor quality groundwater area due to prior agricultural use and existing septic systems. The Dunlap Acres area was inadvertently omitted from the Yucaipa-Calimesa septic tank subsurface disposal system prohibition established by the Regional Board in 1973. The interceptor includes the construction of a major wastewater interceptor pipeline, a force main and pump station. YVWD committed to complete construction of these facilities prior to 2010. Regional Board action may be necessary to require connection of properties to the wastewater collection system, when it is completed.

By *(6 months from effective data of this Basin Plan amendment)*, YVWD shall submit a plan and schedule for construction of the Interceptor. The Interceptor is to be complete no later than January 1, 2010. YVWD shall implement the plan and schedule upon Regional Board approval.

B. Implementation by Regional Board

1. Revision to Yucaipa Valley Water District NPDES Permit

To implement the “maximum benefit” objectives, the Regional Board will revise the NPDES permit for YVWD wastewater discharges to reflect the commitments described above, as appropriate. This includes the following.

The discharge limits for TDS and TIN will be specified as an annual volume-weighted average not to exceed 540 mg/L TDS and 6 mg/L TIN. These limits are based on the “maximum benefit” wasteload allocations shown in Table 5-5. A schedule not to exceed *(three years from the effective date of this Basin Plan amendment)* for compliance with this TIN limit shall be included in the permit. This schedule will enable YVWD to replace its existing denitrification facilities. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative limits are also specified in Table 5-5. Compliance schedules for these alternative limits will be specified in YVWD’s waste discharge requirements, as necessary.

YVWD will be required to implement measures to improve effluent quality when the 12-month running average effluent TDS quality equals or exceeds 530 mg/L for 3 consecutive months, and/or when the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once replacement denitrification facilities are in place).

YVWD's waste discharge requirements will require that recycled water used for recharge shall be limited to the amount that can be blended with other water sources, such as stormwater or imported water, to achieve 5-year running average concentrations equal to or less than the "maximum benefit" TDS and nitrate-nitrogen objectives for the affected management zone (Yucaipa or San Timoteo). Alternative TDS and nitrate-nitrogen limitations based on the "antidegradation" objectives will also be specified for recycled water recharge in these management zones.

The effluent limits for YVWD, which establish an upper limit on TDS and TIN concentrations of recycled water discharged in the Yucaipa and/or San Timoteo Management Zones, are a cornerstone of the maximum benefit demonstration. The cap on effluent TDS and TIN concentrations provides a controlling point for management of TDS and nitrogen water quality. YVWD will be required to initiate the building of a desalter and brine disposal line when the 5-year running average TDS in YVWD's effluent reaches 530 mg/L, or when the volume weighted-average TDS concentration in the Yucaipa Management Zone reaches 360 mg/L. YVWD will immediately implement a salt management program to reduce the salts entering the District's wastewater treatment plant. This salt management program will include: 1) provision of incentives for the removal of on-site regenerative water softeners and the use of off-site regenerative systems; and 2) percolation of State Water Project water into the Yucaipa Management Zone when State Water Project water has low TDS. Implementing these measures will assure that the groundwater quality remains at or below the Yucaipa Management Zone objective of 360 mg/L TDS. Maintenance of this ambient groundwater quality is necessary, in turn, to assure that YVWD's wastewater treatment facility is able to meet the effluent TDS limits. Yucaipa Management Zone groundwater is a significant component of the water supplied in YVWD's service area, and its quality thus has an important effect on effluent quality. Poor ambient quality will preclude YVWD from meeting effluent limits without desalting.

YVWD will be required to submit proposed plans and schedules for the removal/reduction of its wastewater discharges from the unlined reach of San Timoteo Creek and for the construction of the Western Regional Interceptor. YVWD's revised permit will also reflect the surface and groundwater monitoring program requirements described above. This includes the determination of ambient quality in the San Timoteo and Yucaipa Management Zones.

2. Review of Project Status

No later than 2005, and every three years thereafter (to coincide with the Regional Board's triennial review process), the Regional Board intends to review the status of the activities planned and executed by the YVWD to demonstrate maximum benefit and justify continued implementation of the "maximum benefit" water quality objectives. This review is intended to determine whether the commitments specified above and summarized in Table 5-9a are met. As indicated above, if, as a result of this review, the Regional Board finds that the YVWD commitments are not met, the Regional Board will make a finding that the lowering of water quality associated with TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the "antidegradation" objectives) is not of maximum benefit to the people of the state. By default, the scientifically derived "antidegradation" objectives for the San Timoteo (300 mg/L for TDS, 2.7 mg/L for nitrate-nitrogen) and Yucaipa (320 mg/L for TDS and 4.2 mg/L for nitrate-nitrogen Management Zones would become effective (see Chapter 4).

Furthermore, in the event that the projects and actions specified in Table 5-9a are not implemented, the Regional Board will require that the YVWD mitigate the adverse water quality effects, both on the immediate and downstream waters, that resulted from the recycled water discharges based on the "maximum benefit" objectives.

2. San Timoteo and Beaumont Management Zones – City of Beaumont and San Timoteo Watershed Management Authority (STWMA)

As shown in Chapter 4, two sets of TDS and nitrate-nitrogen objectives have been adopted for both the San Timoteo and Beaumont Management Zones: the "maximum benefit" objectives and objectives based on historic ambient quality (the "antidegradation" objectives). The application of the "maximum benefit" objectives for these Management Zones is contingent on the implementation of commitments by the City of Beaumont/STWMA (and, in the case of the San Timoteo Management Zone, by the Yucaipa Valley Water District (YVWD; see preceding discussion)) to implement a specific water and wastewater resources management program [Ref. 10E]. This program is part of a coordinated effort by the member agencies of STWMA to develop and implement projects that will assure reliable water supplies to meet rapidly increasing demands in this area. The San Timoteo Watershed Management Program (STWMP) developed by STWMA entails enhanced recharge of native and recycled water, maximizing the direct use of recycled water, optimizing the direct use of imported water, recharge and conjunctive use.

Wastewater collection and treatment services in the STWMA service area are provided by the City of Beaumont, as well as YVWD. Beaumont discharges tertiary treated wastewater to Coopers Creek, a tributary of San Timoteo Creek, Reach 3. This unlined reach of the Creek overlies and recharges the San Timoteo groundwater management zone.

Table 5-10a identifies the projects and requirements that must be implemented by Beaumont/STWMA to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained. STWMA, acting for all its member agencies, has committed to conduct the regional planning and monitoring activities necessary to implement these "maximum benefit" commitments, and the San Timoteo Watershed Management Program as a whole. Table 5-10a also specifies an implementation schedule. The Regional Board will revise the City of Beaumont's waste discharge requirements and take other actions as necessary to require that these commitments be met. It is assumed that maximum benefit is demonstrated, and that the "maximum benefit" water quality TDS and nitrate-nitrogen objectives apply to the Beaumont and San Timoteo Management Zones, as long as the schedule is being met[8]. If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-10a (and in the case of the San Timoteo Management Zone, the commitments and schedule shown in Table 5-9a (see preceding section)), then maximum benefit is not demonstrated, and the "antidegradation" TDS and nitrate-nitrogen objectives apply. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges affecting these management zones that took place in excess of limits based on the "antidegradation" objectives.

[8] Application of "maximum benefit" objectives for the San Timoteo Management Zone is also contingent on the timely implementation of the commitments by the Yucaipa Valley Water District which are discussed in the preceding section.

Table 5-10a

City of Beaumont and San Timoteo Watershed Management Authority
Maximum Benefit Commitments

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
1. Surface Water Monitoring Program	
a. Submit Draft Monitoring Program to Regional Board	a. (*30 days from effective date of this Basin Plan amendment*)
b. Implement Monitoring Program	b. Within 30 days from Regional Board approval of monitoring plan
c. Quarterly data report submittal	c. April 15, July 15, October 15, January 15
d. Annual data report submittal	d. February 15th
2. Groundwater Monitoring Program	
a. Submit Draft Monitoring Program to Regional Board	a. (*30 days from effective date of this Basin Plan amendment*)
b. Implement Monitoring Program	b. Within 30 days from Regional Board approval of monitoring plan
c. Annual data report submittal	c. February 15th
3. Desalter(s) and Brine Disposal Facilities	
a. Submit plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to be operational as soon as possible but no later than 7 years from date of Regional Board approval of plan/schedule.	a. Within 6 months of either of the following: i. When Beaumont's effluent 5-year running average TDS exceeds 480 mg/L; and/or ii. When volume weighted average concentration in the Yucaipa MZ of TDS exceeds 320 mg/L
b. Implement the plan and schedule	b. Within 30 days from Regional Board approval of monitoring plan
4. Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes. The non-potable supply shall comply with a 10-year running average TDS concentration of 330 mg/L or less	*(*10 years from effective date of this Basin Plan amendment*)*

Description of Commitment	**Compliance Date – as soon as possible, but no later than**	
5. Recycled water recharge The recharge of recycled water in the Beaumont or San Timoteo Management Zones shall be limited to the amount that can be blended with other recharge sources to achieve a 5-year running average equal to or less than the "maximum benefit" objectives for TDS and nitrate-nitrogen for the relevant Management Zone(s). a. Submit baseline report of amount, locations, and TDS and nitrogen quality of stormwater/imported water recharge. b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For stormwater recharge used for blending, submit documentation that the recharge is the result of City of Beaumont/STWMA enhanced recharge facilities/programs	Compliance must be achieved by end of 5th year after initiation of recycled water use/recharge operations. a. Prior to initiation of construction of basins/other facilities to support enhanced stormwater/imported water recharge. b. Annually, by January 15th, after initiation construction of facilities/implementation of programs to support enhanced recharge.	
6. Ambient groundwater quality determination	July 1, 2005 and every 3 years thereafter	
7. Replace denitrification facilities (if necessary to comply with TIN wasteload allocation specified in Table 5-5)	Compliance with 6 mg/L TIN limitation to be achieved by *(*3 years from effective date of this Basin Plan amendment*)*	
8. City of Beaumont recycled water quality improvement plan and schedule a. Submit plan and schedule b. Implement plan and schedule	a. 60 days after the TDS 12-month running average effluent quality equals or exceeds 480 mg/L for 3 consecutive months and/or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once facility/operational changes needed to achieve 6 mg/L TIN are in place) b. Upon approval by Regional Board	
9. Remove/reduce the discharge of Beaumont's effluent from the unlined portion of San Timoteo Creek a. Submit proposed plan/schedule b. Implement plan/schedule	a. *(*6 months from effective date of this Basin Plan amendment*)* b. Upon Regional Board approval	

A. Description of City of Beaumont, San Timoteo Watershed Authority Commitments

1. Surface Water Monitoring Program (Table 5-10a, #1)

The City of Beaumont and the STWMA shall develop and submit for Regional Board approval a surface water monitoring program for San Timoteo, Little San Gorgonio and Noble Creeks at the locations listed in Table 5-10b. The monitoring program must be implemented within 30 days of Regional Board approval of the monitoring plan, and six months of data must be generated prior to the implementation of any changes to the effluent discharge points and before any recycled water is used in the Beaumont or San Timoteo Management Zones.

At a minimum, the surface water monitoring program shall include the collection of monthly measurements of TDS and nitrogen components at locations in San Timoteo, Little San Gorgonio and Noble Creeks (see Table 5-10b). Data reports shall be submitted to the Regional Board's Executive Officer by April 15, July 15, October 15 and January 15 each year. An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted February 15th of each year.

2. Groundwater Monitoring Program (Table 5-10a. #2)

The purpose of the groundwater monitoring program is to identify the effects of the implementation of the Beaumont and San Timoteo Management Zone maximum benefit TDS and nitrate-nitrogen water quality objectives on water levels and water quality within the Beaumont and San Timoteo Management Zones. Prior to discharge of recycled water to the Beaumont and/or San Timoteo Management Zone, the City of Beaumont and the STWMA shall submit to Regional Board for approval a groundwater monitoring program to determine ambient water quality in the Beaumont and San Timoteo Management Zones. The groundwater monitoring program must be implemented within 30 days of approval by the Regional Board.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by February 15th of each year.

3. Desalters and Brine Disposal (Table 5-10a. #3)

The City of Beaumont and the STWMA shall construct and operate desalting facilities and brine disposal facilities when:

a. The 5-year running average TDS concentration in recycled water produced at the City of Beaumont wastewater treatment plant exceeds 480 mg/L, or

b. The volume-weighted TDS concentration in the Beaumont Management Zone equals or exceeds 320 mg/L.

The construction of these facilities will be in accordance with a plan and schedule submitted by Beaumont/STWMA and approved by the Regional Board. The schedule shall assure that these facilities are in place within 7 years of Regional Board approval. These facilities shall be designed to stabilize or reverse the degradation trend evidenced by effluent and/or management zone quality.

Table 5 – 10b

Surface Water Monitoring Sites for Monitoring Water Quality and Quantity
City of Beaumont & San Timoteo Watershed Management Authority

Site Name	Discharge	Owner	Type	Discharge Frequency	Monitoring Period	Water Quality Monitoring Frequency	Period	Analyses
Above confluence With Coopers Cr.	San Timoteo Creek	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Near Hinda Sec.35 T2S,R2W	San Timoteo Creek	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Above confluence With San Timoteo Creek	Coopers Creek	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
At Freeway 10	Little San Gorgonio Cr.	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
At Freeway 10	Noble Creek	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Bi-weekly	Jan-Dec	TDS, TIN, Physical
Recharged to Beaumont MZ	State Water Project	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Monthly	Jan-Dec	TDS, Nitrate-N
Recharged to Beaumont MZ	Storm water	Beaumont & STWMA	Total Discharge	Bi-weekly	Jan-Dec	Monthly	Jan-Dec	TDS, Nitrate-N

4. Non-potable water supply distribution system (Table 5-10a, #4)

Like YVWD, the City of Beaumont is constructing a non-potable water system that will convey untreated State Project water and recycled water for irrigation within its service area. The intent of blending these sources is to minimize the impact of recycled water use on groundwater quality in the proposed Beaumont and San Timoteo Management Zones. A higher proportion of State Project water will be used in wet, surplus years, while larger amounts of recycled water will be used in dry, deficit years.

5. Recycled Water Use (Table 5-10a, #5)

The use of recycled water within the Beaumont Management Zone is a critical component of the City of Beaumont and STWMA water management plan and is necessary to maximize the use of the water resources of the Beaumont area.

The demonstration of “maximum benefit” and the continued application of the “maximum benefit” objectives depends on the combined recharge (recycled water, imported water, storm water) to the Beaumont Management Zone of a 5-year annual average (running average) TDS concentration of 330 mg/L and a nitrate-nitrogen concentration of 5 mg/L. If recycled water recharge in the San Timoteo

Management Zone is pursued, then the application of the "maximum benefit" objectives will depend on the combined recharge to that Zone of 5-year annual average (running average) concentrations of 400 mg/L or less TDS, and 5 mg/L or less nitrate-nitrogen.

To comply with this requirement, the STWMA member agencies are developing plans to recharge and store State Project water in the proposed Beaumont Management Zone. The Beaumont-Cherry Valley Water District (BCVWD) is developing a new 80-acre groundwater recharge project that will increase storm water recharge in the Beaumont Basin by 4,100 acre-ft/yr. This facility will also be used to recharge State Water project water. The City of Beaumont is also developing storm water recharge in facilities in newly developing areas, which is expected to result in the recharge of an additional 2,400 acre-ft/yr of stormwater runoff.

Accordingly, the use of recycled water for use or recharge in the Beaumont or San Timoteo Management Zone shall be limited to the amount that can be blended on a volume-weighted basis with other sources of recharge to achieve 5-year running average concentrations less than or equal to the "maximum benefit" objectives for the affected groundwater management zone. The 25% nitrogen loss coefficient will be applied in determining the amount of recharge of other water sources that must be achieved to meet the 5-year running average nitrogen concentrations.

6. Ambient Groundwater Quality Determination (Table 5-10a, # 6)

By July 1, 2005, and every three years thereafter, the City of Beaumont and STWMA shall submit a determination of ambient TDS and nitrate-nitrogen quality in the Beaumont and San Timoteo Management Zones. This determination shall be accomplished using methodology consistent with the calculation (20-year running averages) used by the Nitrogen /TDS Task Force to develop the TDS and nitrate-nitrogen "antidegradation" water quality objectives for groundwater management zones within the region [Ref. 1].

7. Replacement/modification of denitrification facilities (Table 5-10a, #7)

The City of Beaumont has committed to produce recycled water with a 12-month average TIN concentration of 6 mg/L or less by 2008. This may be accomplished via operational changes, or may require the installation/modification of facilities. This TIN effluent quality is specified in the TIN wasteload allocation (see Table 5-5) and is necessary to assure compliance with the proposed "maximum benefit" nitrate-nitrogen objective for the Beaumont and San Timoteo Management Zones (5 mg/L). An appropriate schedule, not to exceed *(3 years from effective date of this Basin Plan amendment)* for compliance with this effluent limit will be specified in a revised NPDES permit for the City.

8. City of Beaumont Wastewater Management (Table 5-10a, #8)

Beaumont expects to limit the TDS concentration in its effluent to less than or equal to 490 mg/L by using a low TDS source water supply for potable uses, selective desalting of either source water and/or recycled waters, and minimizing the TDS waste increment.

Within 60 days after the Beaumont 12-month running average concentration for TDS equals or exceeds 480 mg/L for 3 consecutive months, or the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once facility/operational changes needed to achieve 6 mg/L TIN are in place), the City of Beaumont shall submit to the Regional Board a plan and time schedule for implementation of measures to insure that the average agency wastewater effluent quality does not exceed 490 mg/L and 6 mg/L for TDS and TIN, respectively. The plan and schedule are to be implemented upon approval by the Regional Board.

9. Relocation of San Timoteo Creek Discharge (Table 5-10a, #9)

Like YVWD, Beaumont has established the goal of eliminating its discharge to the unlined reach of San Timoteo Creek by 2008 to minimize the impacts of these discharges on the San Timoteo Management Zone. The STWMP anticipates that Beaumont's recycled water will be almost completely reused within the Beaumont area for landscape irrigation, habitat enhancement, and potentially for groundwater recharge. Like YVWD, Beaumont and STWMA are also considering the export of a portion of Beaumont's surplus recycled water to the San Jacinto basin, where the TDS objectives are higher than those for the Beaumont Management Zone and recycled water demands are greater than supplies. Some limited recycled water discharge to Coopers Creek and thence /San Timoteo Creek may need to be continued to support existing riparian habitat.

Whole or partial removal of the discharge from the unlined reach of San Timoteo Creek would improve the quality of groundwater in the San Timoteo Management Zone and supplement recycled water supplies available for reuse elsewhere in the service area.

By *(*6 months from effective date of this Basin Plan amendment)* Beaumont/STWMA shall submit a proposed plan and schedule to remove/reduce the discharge of recycled water to the unlined reach of San Timoteo Creek. The plan and schedule shall be implemented upon Regional Board approval.

B. Implementation by Regional Board

1. Revision of City of Beaumont NPDES Permit

To implement the "maximum benefit" objectives, the Regional Board will revise the NPDES permit for the City of Beaumont wastewater discharge to reflect the commitments described above, as appropriate. This includes the following.

The discharge limits for TDS and TIN will be specified as an annual volume-weighted average not to exceed 490 mg/L TDS and 6 mg/L TIN. These limits are based on the wasteload allocation shown in Table 5-5. A schedule not to exceed *(three years from the effective date of this Basin Plan amendment)* for compliance with this TIN limit shall be included in the permit. This schedule will enable Beaumont to make the necessary facility/operational changes. Alternative TDS and nitrate-nitrogen limitations based on the "antidegradation" objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative limits are also specified in Table 5-5. Compliance schedules for these alternative limits will be specified in Beaumont's waste discharge requirements, as necessary.

Beaumont will be required to implement measures to improve effluent quality when the 12-month running average effluent TDS quality equals or exceeds 480 mg/L for 3 consecutive months, and/or when the 12-month running average TIN concentration equals or exceeds 6 mg/L in any month (once the facility/operational changes necessary to assure compliance with the 6 mg/L limit are in place).

Beaumont's waste discharge requirements will require that recycled water used for recharge shall be limited to the amount that can be blended with other water sources, such as stormwater or imported water, to achieve 5-year running average concentrations equal to or less than the "maximum benefit" TDS and nitrate-nitrogen objectives for the affected management zone (Beaumont or San Timoteo).

The effluent limits for the City of Beaumont, which establish an upper limit on TDS and TIN concentrations of recycled water discharged in the management zones, are a key part of the maximum benefit demonstration. The cap on effluent TDS and TIN concentrations provides a controlling point for management of TDS and nitrogen water quality. The City of Beaumont has committed to initiate the building of a groundwater desalter and brine disposal line when the TDS in the City's effluent reaches 480 mg/L. Further, the City will immediately implement a salt management program to reduce the salts entering the City's wastewater treatment plant. This salt management program will include: 1) provision of incentives for the removal of on-site regenerative water softeners and the use of off-site regenerative systems; and 2) percolation of State Water Project water into the Beaumont Management Zone when State Water Project water has low TDS. Implementing these measures will assure that the groundwater quality remains at or below the Beaumont management zone objective of 330 mg/L TDS. Maintenance of this ambient groundwater quality is necessary, in turn, to assure that the City's wastewater treatment facility is able to meet the effluent TDS limits. Beaumont Management Zone groundwater is a component of the water supplied to the City and its quality thus has an important effect on the effluent quality. Poor ambient quality will preclude the City from meeting effluent limits without desalting.

Beaumont will be required to submit a proposed plan and schedule for the removal/reduction of its wastewater discharges from the unlined reach of San Timoteo Creek. Beaumont's revised permit will also reflect the surface and groundwater monitoring program requirements described above. This includes the determination of ambient quality in the San Timoteo and Beaumont Management Zones.

2. Review of Project Status

No later than 2005, and every three years thereafter (to coincide with the Regional Board's triennial review process), the Regional Board intends to review the status of the activities planned and executed by the City of Beaumont and STWMA to demonstrate maximum benefit and justify continued implementation of the "maximum benefit" water quality objectives. This review is intended to determine whether the commitments specified above and summarized in Table 5-10a are met. As indicated above, if, as a result of this review, the Regional Board finds that the City of Beaumont and STWMA commitments are not met, the Regional Board will make a finding that the lowering of water quality associated with TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the "antidegradation" objectives) is not of maximum benefit to the people of the state. By default, the scientifically derived "antidegradation" objectives for the Beaumont and San Timoteo Management Zones would become effective (230 mg/L TDS and 1.5 mg/L nitrate-nitrogen for the Beaumont Management Zone; 300 mg/L TDS and 2.7 mg/L nitrate-nitrogen for the San Timoteo Management Zone (see Chapter 4).

Furthermore, in the event that the projects and actions specified in Table 5-10a are not implemented, the Regional Board will require that the City of Beaumont and STWMA mitigate the adverse water quality effects, both on the immediate and downstream waters, that resulted from the recycled water discharges based on the "maximum benefit' objectives. As for CBW/IEUA and YVWD, discharges in excess of the antidegradation objectives that must be considered for mitigation include both recycled water and imported water, at TDS concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load.

(End of Salt Management Plan Section)

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REFERENCES (excerpt): Revise the References as follows:

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2. ~~Wildermuth, Mark J., "Final Summary Report, TDS and Nitrogen Studies, Santa Ana Watershed," February 1991.~~Wildermuth Environmental, Inc., "Santa Ana Watershed Data Collection and Management Program, Final Technical Memorandum," October 2001.

3. ~~California Regional Water Quality Control Board – Santa Ana Region, Staff Report, "Nitrogen and TDS Studies, Upper Santa Ana Watershed," April 1991.~~Wildermuth Environmental, Inc., "TIN/TDS Study - Phase 2B of the Santa Ana Watershed, Wasteload Allocation Investigation Memorandum," October 2002.

4. ~~California Regional Water Quality Control Board – Santa Ana Region, Staff Report, "Nitrogen and TDS Studies, Upper Santa Ana Watershed," July 1991.~~Wildermuth Environmental, Inc., Memo to TIN/TDS Task Force, "Transmittal of Final Tables, Figures and CD in Support of Basin Plan Amendments – TIN/TDS Study," October 2002.

5. Wildermuth Environmental, Inc., "June 2003 Addendum TIN/TDS Study – Phase 2B of the Santa Ana Watershed Wasteload Allocation Investigation," July 2003

6. California Regional Water Quality Control Board – Santa Ana Region, "Guidelines for Sewage Disposal from Land Developments," January 1979.

~~6.~~7. State Water Resources Control Board, "Order No. 73-4, Rancho Caballero Decision," April 1972.

~~7.~~8. Department of Water Resources, "Mineral Increases from Municipal Use of Water in the Santa Ana River Basin," Memorandum Report, June 1982.

9. ~~California Regional Water Quality Control Board – Santa Ana Region, Staff Report, "Santa Ana River at Prado Dam, Results of Annual Water Quality Sampling for 1990," December 1990.~~City of Riverside, Memo from Rod Cruze to TIN/TDS Task Force," Nitrogen Loss Assumptions for Reach 3 of the Santa Ana River," April 2002.

10A. ~~Santa Ana Watershed Project Authority, "Arlington Desalter, Project Facts," undated.~~California Regional Water Quality Control Board – Santa Ana Region, Staff Report, "Santa Ana River at Prado Dam, Results of Annual Water Quality Sampling for 2002", April 2003.

10B. Chino Basin Watermaster, Letter to Gerard Thibeault, "Chino Basin Watermaster Proposal for New Total Dissolved Solids (TDS) and Nitrogen Water Quality Objectives for the Chino and Cucamonga Basins Based on Maximum Beneficial Use," December 2002.

10C. Chino Basin Watermaster, "Chino Basin Optimum Basin Management Plan," 1999.

10D. Yucaipa Valley Water District, Letter to Gerard Thibeault, "Yucaipa Valley Water District Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the San Timoteo and Yucaipa Management Zones Based on Maximum Beneficial Use," January 2002.

10E. San Timoteo Watershed Management Agency, Letter to Gerard Thibeault, "Revised San Timoteo Watershed Management Agency Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the Beaumont, San Timoteo and Yucaipa Management Zones Based on Maximum Beneficial Use," December 2002 (Revised November 11, 2003).

(Chapter 5 – Implementation Plan References continue)